SUPPLEMENT.

The Mining Journal,

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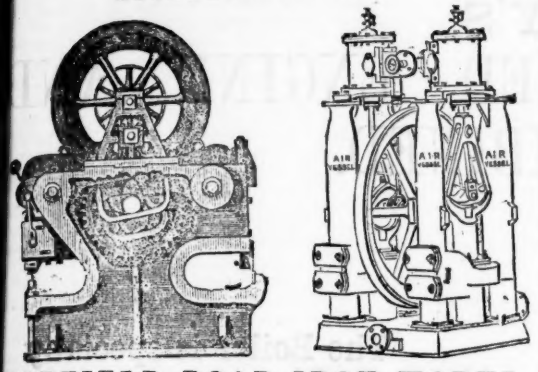

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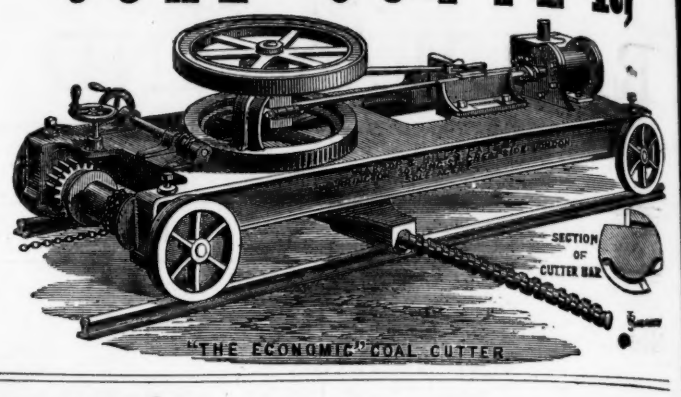

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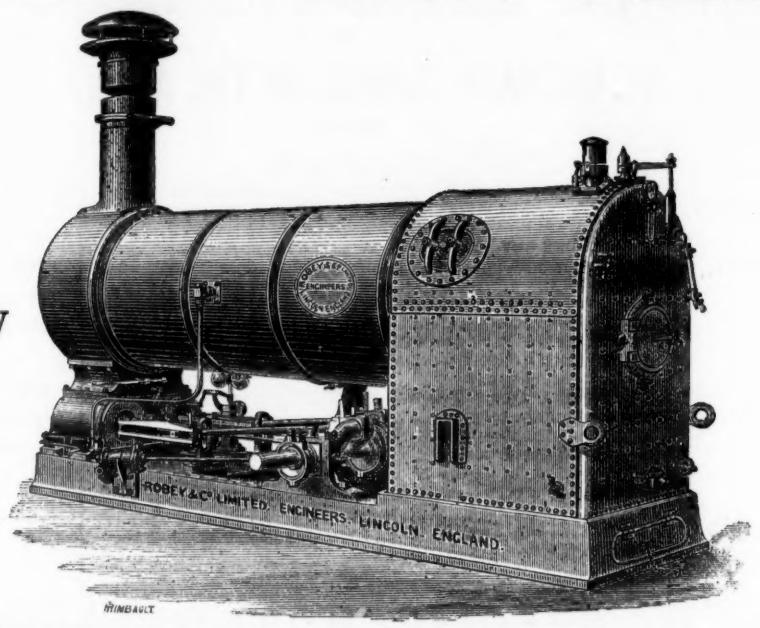

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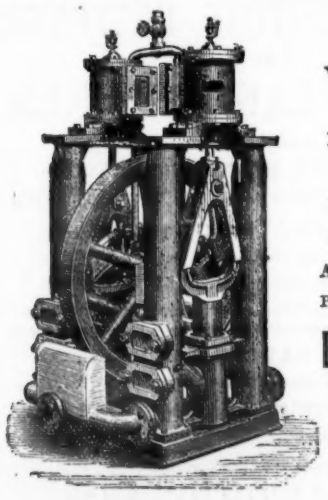

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Original Correspondence.

THE IRON INDUSTRIES OF DURHAM AND NORTHUMBERLAND.

By RICHARD MEADE, Assistant Keeper of Mining Records, Museum of Practical Geology.

Although the ores of iron, known commonly as clay ironstones, or argillaceous carbonate of iron, are widely distributed through most of our coal fields, and, in fact, furnish nearly two-thirds of the total ore raised in the United Kingdom, they are, nevertheless, found in very limited quantity in the coal measures of these northern counties. This Great Northern Coal Field is, on the other hand, the most important in the kingdom for its coal, having a known area of 460 square miles, and an estimated available area of 336 square miles. In 1873 the total coal raised in the United Kingdom, according to returns obtained by the Mining Record Office, amounted to 127,016,747 tons, of which quantity 29,640,385 tons were raised in this coal field, or 23¼ per cent. of the total production.

In the carboniferous limestone in Weardale, in Durham, the iron ore obtained is known as spathic carbonate, occurring in lodes associated with lead and zinc ores. The spathic ores, analysed by Mr. A. B. Dick in Dr. Percy's laboratory in the Royal School of Mines, gave from 38·56 to 43·02 per cent. of metallic iron; the samples selected for analysis were from West Level and Rispey, in Weardale. Formerly a "blackband," or carbonaceous ore, was obtained at Hadley and Haydon Bridge, and another variety of ore occurring in nodules in the neighbourhood of Haltwhistle, but these have long ceased to be wrought.

PIG-IRON MANUFACTURE.—Numerous indications exist in the neighbourhood of Lanchester, and Chester-le-Street, in Durham, and in the valleys of the Reed and the Tyne, in Northumberland, where on the moors may be seen heaps of scoriæ or slag, pointing to the smelting or reduction of iron ore at a very remote period; it would be interesting to trace the early history and progress of this industry in these counties in the last century, for which there are ample data, but as space is wanting we find it more convenient to restrict our enquiries to the present century. About the year 1800 the Tyne Iron Company, at Lemington, in Northumberland, erected two blast-furnaces, the make of one of these, in 1812, is recorded as 2547 tons, and another return in 1823 gives the production of both furnaces as 2379 tons, from which it may be inferred that they were in blast but a part of that year. In 1829 the two furnaces at the Birtley Works, near Chester-le-Street, in Durham, were put in blast by the Birtley Iron Company, and in 1830 the make of these furnaces is stated to have been 3080 tons, the make of the Lemington furnaces the same year being 2247 tons, or a total make in both counties, in 1830, of 5327 tons of pig-iron. At Wylam, in 1836, the first furnace was put in blast, and between that year and 1839 the Ridsdale Company blew in a furnace, increasing the number to three in 1841, in which year the Hareshaw Company commenced operations with one furnace, to which they subsequently added two others; the iron produced at both these works was of a superior quality, but distance from railways and markets added so considerably to the cost of the iron as to render competition impossible, eventually both works were closed, and finally dismantled. The Walker Works of Messrs. Losh, Wilson, and Bell, established about the year 1827 for the manufacture of bar-iron, were extended in 1842, by the company erecting a blast-furnace, succeeded by a second in the year 1844; at these works mill-furnace cinder was used with Cleveland ironstone, from the vicinity of Whitby, in the make of forge pig-iron, and these furnaces, it should be stated, were the first ever built expressly for smelting the then recently discovered ironstone of the North Riding of Yorkshire. About the same year, 1844, the Stanhope furnace, built by Mr. Cuthbert Rippon, was put in blast, and five others were built at Towlaw, by the Weardale Iron Company; while in 1846 the works at Witton Park, in the Auckland district, were erected by Messrs. Bolckow and Vaughan. The following list will show the works existing and in operation in both counties in the year 1851, with the number of furnaces built and in blast:—

NORTHUMBERLAND.	Furnaces.	
Works.	Built.	In blast.
Hareshaw	3	0
Ridsdale	3	0
Tyne	2	2
Walker	2	2
Witton Park	4	3
Wylam	1	1
Total	15	8

DURHAM.	Furnaces.	
Works.	Built.	In blast.
Birtley	3	1
Consett and Crookhall.	14	7
Stanhope	1	1
Towlaw	5	2
Total	23	11

In 1830, as previously stated, the make of pig-iron amounted to 5327 tons. In the same year the make of pig-iron in England and Wales, the produce of 333 furnaces, was 615,917 tons; that of Scotland, with 27 furnaces, being 37,500 tons. The production continued to increase steadily in this district, and in 1839 it rose to 13,000 tons. About 1840 and 1841 a general depression of trade came about, the quotations of pig-iron being very low, and its manufacture comparatively unremunerative. Happily this state of things was of brief duration, and was in 1844 succeeded by a period of activity, when a great expansion of our railway system took place, causing a good demand for iron of all kinds, and better prices. The demand for iron continued, and caused inquiries for fresh supplies of ore and stone to meet it; hence the exploration of old areas and search for new ones, containing deposits of ironstone, resulting a few years later in the discovery of the vast fields of argillaceous carbonates of the lias in Cleveland, and the hydrated peroxides of Northamptonshire and Lincolnshire; the two first-named districts having since largely contributed to feed the furnaces of Durham and Northumberland. During the years from 1844 to 1847 the construction of 9379 miles of railway was authorised by Parliament in the United Kingdom, and with it increased activity ensued, as we find that in 1847, from a return presented to Parliament, the make of these counties, with 24 furnaces in blast, amounted to 99,840 tons of pig-iron. In the same year the make of Great Britain, of 433 furnaces, was 1,999,608 tons, of which England and Wales, with 344 furnaces, contributed 1,459,640 tons, and 89 in Scotland 539,968 tons of pig-iron, or an average of 4620 tons per furnace. Advancing to the year 1852 we find the production of pig-iron in Great Britain increasing to the extent of 35 per cent., of which England and Wales contributed 1,926,000 tons, the yield of 384 furnaces, and Scotland 775,000 tons, with 113 furnaces. The make of seven furnaces in Northumberland the same year being 35,000 tons, and Durham, with 18 furnaces, 110,000 tons, the average yield of each furnace per annum being 5200 tons, which, when compared with 1847, shows an increase to the extent of 580 tons per furnace. It will here be convenient to show, side by side, the production of pig-iron in Durham and Northumberland, with the number of furnaces in blast in each of the following years:—

	NORTHUMBERLAND.		DURHAM.	
	No. of furnaces.	Tons of pig-iron.	No. of furnaces.	Tons of pig-iron.
1856	8	62,120	40	269,250
1860	7	69,093	37	340,921
1865	7	49,290	47	476,767
1870	3	33,623	50¼	676,964
1871	3	34,165	47½	759,244
1872	4	38,766	49	760,172
1873	4	44,807	49¾	799,573

This table shows a falling off in Northumberland in the number of furnaces in blast, and the make of pig-iron, while in Durham during the same period from 1856 to 1873 the production has increased threefold. In considering the question of the quantities of ironstone, ore, and coal employed in making pig-iron, it will be convenient to deal collectively with the two districts, rather than make each the subject of a separate enquiry. For this purpose the united production of 53 furnaces in 1872, amounting to 798,938 tons, and of 54¾ furnaces in 1873, amounting to 844,380 tons of pig-iron, is taken as a basis.

IRON ORE.—The ore (uncalcined) used in the manufacture of the above-named quantities of pig-iron amounted in 1872 to 2,623,895 tons, and in 1873 to 2,870,791 tons. These quantities during the years 1872 and 1873 were made up of ores imported from foreign countries, received at the following ports:—

Ports.	1872—Tons.	1873—Tons.
Berwick	—	150
Hartlepool	33,413	13,850
Newcastle-on-Tyne	82,979	114,986
Shields, North	9,562	15,044
Shields, South	20,149	20,564
Stockton	2,229	440
Sunderland	33,857	23,393
Total	182,189	188,407

The total imports of foreign ores into Great Britain in the same years amounted in 1872 to 801,503 tons, and in 1873 to 967,536 tons, of which 20 per cent. was used in the district under consideration. Of the other ores brought into the district, the following shows the quantities contributed from the respective iron fields:—

From	1872—Tons.	1873—Tons.
Cumberland	85,139	44,281
Lancashire	58,096	37,821
Northamptonshire	20,000	25,000
Cleveland	2,100,000	2,392,000
Total	2,263,235	2,499,102

During the same years the ores obtained in the Weardale and other districts within these counties were as under:—

Districts.	1872—Tons.	1873—Tons.
Weardale	97,953	99,393
Ridsdale	20,518	13,889
Middle Moor	10,000	10,000
Total	128,471	123,282

The following statement summarises the sources from whence the ores employed were derived:—

Localities.	1872—Tons.	1873—Tons.
Foreign	182,189	188,407
English	2,263,235	2,499,102
Local	128,471	123,282
Other	50,000	60,000
Total	2,623,895	2,870,791

Under other ores is included "purple ore," a residue derived from pyrites after the sulphur and copper have been extracted (and to which future reference will be made under the head of Metal Extraction Works), and ores from Cornwall and Devonshire.

A reference to the foregoing will show how extensively the district has been supplied by Cleveland stone to the extent of 88 per cent. of all smelted, the remaining 12 per cent. being contributed by other British districts and foreign ores. The yield of metallic iron of the ores used may be taken as follows:—Northamptonshire, 40 per cent.; Cleveland, 30 per cent.; Cumberland, 66 per cent.; Lancashire, 64 per cent.; local ores, from 38 to 43 per cent., the average of many analyses, and foreign ores from 50 to 60 per cent., while the purple ore varies from 62 to 67 per cent. The Cleveland stone, so extensively used, would if alone employed require 70 cwts. of raw uncalcined stone to produce 20 cwts. of pig-iron, but with the imported hematites and ores from other districts the actual quantity used is reduced to between 67 and 68 cwts.

The following shows the works, names of owners, and furnaces built and in blast in both counties in 1873:—

Names of works.	Owners.	Furnaces. Built.	In blast.
NORTHUMBERLAND:—			
Elswick, Newcastle-on-Tyne	Sir W. G. Armstrong and Co.	2	2
Hareshaw	Hareshaw Iron Company	2	0
Lemington-on-Tyne	Bulmer and Co.	2	0
Walker, Newcastle-on-Tyne	Bell Brothers	3	2
Wylam	Bell Brothers	1	0
Total		10	4
DURHAM:—			
Acklam, Middlesborough-on-Tees	Stevenson, Jaques, and Co.	4	4
Clarence, Middlesborough-on-Tees	Bell Brothers	8	8
Consett, Durham	Consett Iron Company (Limited)	6	5¼
Ferry Hill	Rosedale & Ferry Hill Iron Co.	8	8
Jarrow	Palmer's Shipbuilding & Iron Co.	4	4
Middleton, Darlington	George, Wythes, and Co.	3	3
Norton, Stockton-on-Tees	Norton Iron Company (Limited)	3	3
Norwegian	Titanic Iron Company (Limited)	2	1
Seaham	Walson, Kipling, and Co.	1	1
South Durham, Darlington	South Durham Iron Company	3	3
Thornaby, Stockton	William Whitwell and Co.	5	3
Towlaw	Weardale Iron and Coal Co. (L.)	4	3
Tudhoe	Weardale Iron Co.	2	2
Wear, Washington	Bell Brothers	1	1
Total		54	49¾

The pig-iron made in both counties in 1872 was 798,938 tons, consuming in the reduction of the ores, all purposes included, 1,890,766 tons of coal (the produce of the districts converted into coke), giving an average consumption of 47½ cwts. of coal to each ton of pig-iron made, while in 1873 the pig-iron make amounted to 844,380 tons, consuming 1,949,407 tons of coal, showing a diminution of 1 cwt. in each ton of pig-iron made, the actual average quantity of coal employed being 46¼ cwts. It will be as well to mention that the result of an enquiry, instituted in 1869 by the Royal Coal Commission, ascertained the consumption of coal used in making 1 ton of pig-iron to be about 60 cwts. In 1872 and 1873 the inquiry was pursued by the Mining Record Office, and the above are the results obtained. The economy in the consumption of fuel has thus within a few years greatly increased, and since special interest now attaches to this subject, it may reasonably be expected that the returns of each successive year will further exhibit economy in the coal used in this branch of our iron industries.

The average make of the Northumberland quarries was in 1872 9691 tons, and 11,202 tons in 1873, while the average of the Durham furnaces in the same years was 15,514 tons and 16,071 tons respectively, the total make of both counties being nearly 13 per cent. of the total production of Great Britain.

MILLS AND FORGES, AND BESSEMER STEEL WORKS.—This industry, consisting in the manufacture of the various forms of malleable iron, may be said to date from the middle of the last century, at which period several works are known to have been established at various suitable localities where water-power was available as a source of motion, to drive small hammers, forges, &c.; some of the earliest of these works appear to have been at Swallwell, Beamish and Lumley, Gateshead, Lemington, and Bedlington. The last-named works dates about 1809, and it was at these works, in 1820, that malleable iron rails were first rolled, the invention of a Mr. Birkenshaw. At the Walker Works, about 1827, was erected what was considered at that time in the North a powerful rolling-mill, capable of rolling from 80 to 100 tons of bars per week; these works, in 1833, led the way in extending the operation to the puddling of pig-iron. The foregoing works, and others subsequently established, increased their appliances for producing wrought and puddled iron, and in 1862 the 17 works then in operation had an aggregate of 646 mills and forges, the estimated make of malleable iron being about 300,000 tons. For some of the foregoing facts we are indebted to the very instructive and valuable paper of Mr. Isaac Lowthian Bell, "On the Manufacture of Iron," read at the meeting of the British Association for the Advancement of Science, held at Newcastle-upon-Tyne, in 1863. Without going into detail as to the precise date at which the several important works of recent years have been established, which have contributed so much to the welfare and prosperity of the North of England, we will take up the year 1872, when we find no less than 22 works in Northumberland and Durham making the various forms of malleable iron rails, plates, &c., and having an aggregate of 1189 puddling-furnaces and 66 rolling-mills, and at the Tudhoe Works of the Weardale Company 4 Bessemer convertors, each having a capacity of 50 cwts.; in all these works it has been ascertained that the coal employed in 1872 amounted to 1,259,000 tons. The same works in 1873 numbered 1194 puddling-furnaces, the rolling-mills and Bessemer convertors stood as in 1872, while the quantity of coal consumed amounted to 1,264,000 tons. The following is a list of the works in operation in 1873:—

Name of works.	Name of firm.	Situated.	Puddling furnaces.	Rolling mills.
DURHAM:—				
Auckland	Thos. Vaughan and Co.	Bishop Auckland	33	1
Whashoe	Thos. Vaughan and Co.	Darlington	36	—
Hartlepool	Hartlepool Malleable Iron Co.	Hartlepool	33	2
Jarrow	Palmer Shipbuilding and Iron Company (Limited)	Newcastle	78	4*
Albert Hill	Darlington Iron Company	Darlington	203	8
Springfield	Darlington Iron Company			
Birtley	Birtley Iron Company	Chester-le-Street	5	1
Consett	Consett Iron Co. (Limited)	Durham	156	7†
Britannia	Hopper, Radcliffe, and Co.	Fence Houses	36	3
Gateshead	Hawks, Crawshay, and Sons	Gateshead	76	5
Hire	John Elliott	East Jarrow	12	3
Monkwearmouth	Samuel Tyzack and Co.	Sunderland	32	4
Tudhoe	Weardale Iron & Coal Co. (L.)	Ferry Hill	64	5
Skerne	Skerne Ironworks Co. (L.)	Darlington	60	4
West Hartlepool	West Hartlepool Iron Co. (L.)	Hartlepool	112	3
Rise Carr	Fry, Janson, and Co.	Darlington	32	4
Stockton Rail Mill	Stockton Rail Mill Co.	Stockton	70	1
Park	J. Abbott and Co. (L.)	Gateshead	36	3
Albion	Felling Coal, Iron, & Chemical Company (Limited)	Gateshead	32	2
Thornaby	W. Whitwell and Co.	Darlington	34	2
NORTHUMBERLAND:—				
Walker	Bell Brothers	Newcastle	54	4
Total of both counties			1194	66

* 2 plate and 2 bow mills. † 6 plate and 1 rail mill.

The average quantity of coal required to convert the crude metal into finished iron deduced from numerous returns is found to vary from 45 to 50 cwts. to each ton; taking the last-named quantity and the total coal used in these works in 1873, we should have something like 500,000 tons of iron and steel represented by 1,264,000 tons of coal used; this amount must be regarded as an approximation, and is only noted to give some general idea of the gigantic nature of this branch of the iron industries.

METAL EXTRACTION WORKS AT NEWCASTLE-UPON-TYNE.—The chemical manufactures of the Tyne, having separated the sulphur from the coppery pyrites, dispose of the "burnt ores" to the above-named works; when the copper is extracted, the residue remaining contains from 62 to 67 per cent. of metallic iron, equal to the richest iron ores; this residue is known as "purple ore" (oxide of iron) and "blue billy" of the puddlers, and from its rich character is of considerable value as a fettling in the puddling-furnaces of this and other districts. At the works of the Palmer Shipbuilding Company, at Jarrow, it is used in the blast-furnaces in the form of blocks as well as powder. In the year 1873 the works engaged in this industry, of which there are 23 in Great Britain, operated upon 323,910 tons, from which was obtained 12,810 tons of fine copper, the residue of "purple ore" amounting to 275,000 tons. The following is a list of the works in these counties, with the quantities of "burnt ore" treated in 1873:—

Name of firm.	Situated.	Tons.
Tharsis Sulphur and Copper Company (Limited).	Newcastle	126,000
William Russell and Co.	ditto	5,000
Bede Metal and Chemical Company (Limited)	ditto	52,670
J. and W. Allen	ditto	5,000
Jarrow Chemical Company	ditto	4,000
Solomon Mease and Co.	So. Shields	9,000

The quantity operated upon by the Tharsis Company includes what was used at their other works at Birmingham and Glasgow.

IRON SHIPBUILDING.—This most important industry of the Tyne, Wear, and Tees dates from the year 1840, and has progressed steadily; in 1862 the estimated tonnage of ships launched and the tonnage on the stocks building at the end of the year was as follows, with the weight of iron employed:—

District.	Tonnage launched.	Tonnage building.	Weight of iron. Tons.
Tyne	32,175	33,000	22,540
Wear	15,608	19,000	9,360
Tees	9,660	10,660	6,760
Total	57,443	62,660	38,660

In 1871 on the Tyne was launched 19 vessels, with a gross tonnage of 22,565 tons; on the Wear, 79 vessels, of 75,530 tons burden; and on the Tees, &c., 36 vessels, of 42,950 tons, or an aggregate of 134 vessels and 141,045 tons burden. While in 1873 on the Tyne alone was launched a gross tonnage of iron vessels of 87,913 tons.

The statement of the Cleveland Ironmasters' Association, which includes the blast-furnace works of Durham, Northumberland, and Cleveland, shows that in 1874 and preceding years the make of pig-iron was as follows:—

Year.	Tons.	Year.	Tons.
1869	1,459,508	1872	1,968,972
1870	1,695,377	1873	1,999,491
1871	1,884,239	1874	2,001,233

In the year 1873, of the 139 furnaces built 132 were in blast; while in 1874, of the 155 erected 125 were in operation, giving an average make per furnace of 16,000 tons. The same statement shows that in the district within the action of the Association in Durham the Messrs. Bell Brothers are erecting two furnaces at Clarence, in addition to two put in blast last October; the West Hartlepool Company have three in blast; Messrs. Bolckow and Vaughan have one building at Witton Park, near Auckland; the Consett Company another, and the Rosedale and Ferryhill Company two more, while in Cleveland the Loftus Company have two blowing, and Messrs. Robson and Co. two building at Redcar, Messrs. Hopkins, Gilkes, and Co. two at Teesside, and Messrs. C. and J. Bagnall, jun., one at Grosmont. The mills and forges will show a considerable falling off in their production as compared with 1873. It was estimated that towards the end of last November 700 puddling-furnaces were off work, principally in the Stockton, Darlington, Hartlepool, and Middlesborough districts, due to commercial depression; since the present year has commenced prospects have improved but little, yet hopes are still entertained of a revival as the spring advances.

It has been recently stated, in considering the resources of the mills and forges in the North of England, that the majority of these works, employing two-thirds of the puddling-furnaces, were dependent upon the open market for the purchase of all their materials, being exclusively finished ironworks, without the adjuncts of blast-furnaces, mines, or collieries; while the remaining works, with about one-third of the puddling-furnaces, have the command of their own pig and in some cases their own coal, which gives these latter works a more favourable basis for operation.

In conclusion, it may be observed that the Bilbao Iron Company—largely composed of shareholders in the ironworks of the North of England, and whose interests have suffered much by the unsettled state of affairs in Spain—are likely ere long to be enabled to resume their shipments of ore to this country. The mines of the company, situated in territory held by the Carlists, were subjected to a tax which the Government of Madrid met by reprisal—forbidding the export of the ore; current events, however, indicate a removal of the prohibition, and with it the renewal of imports, on a large scale, of iron ore from Spain.

COAL FOR BIRMINGHAM.

SIR,—It will be fresh in the minds of many of your readers that just as the Birmingham political and commercial wise men began to roar out to Parliament and the world their predictions and ill-forebodings respecting the short supply of gold, compared with the requirements of England alone, and the cry for a paper money circulating medium, the great gold fields which are now flooding the markets of the world with their precious produce were discovered, and promise to supply every requirement to this state of fear and excitement. A striking coincidence has within the last two or three years occcurred; Birmingham, again, began to cry out "What shall we do for coal? The best days of Birmingham have gone! Where will the coal come from to keep our works going?" &c. And just as the discovery of gold astonished the old gentlemen of the past, so have the recent discoveries of coal astonished the wise faint-hearts of to-day, who had forgotten "Sufficient for the day is the evil thereof."

The Sandwell Park Company was started fairly as a speculation; no one was certain what the result would be, hope led the subscribers forward, and success so far has been their reward. The Spon Lane fault, as it was called, has not yet been found at Sandwell Park Colliery in the direction for Birmingham (because they have not driven in that direction), although it was proved, and its bearing taken at the pits about Oldbury, and believed to run up or about Spon Lane, therefore it is certain that the Sandwell Park Company have a field of coal which will last many years. Again, the Blakeley Hall Colliery Company have driven into their estate, and found a bed of coal, we are informed the very best in South Staffordshire, 10 yards thick, without a particle of spail or bat, and so far perfectly free from fault, although close on the well-known Titford

fault before referred to. Again, two other colliery companies have just started, with every reasonable and just hope of equal success; in fact, the discovery of coal for South Staffordshire may safely be looked upon as equal to its full supply for at least another 100 years. Therefore, it is clear we can safely depend on a supply of coal, and the fires in Birmingham and the Black Country kept shining. The fault, we are told, is expected to take a little off the south-east corner of Blakeley Hall; if so the turn of the fault must be rather sharp, or the Sandwell Park Colliery would have been over it a considerable distance.

The Blakeley Hall Company has undergone a great change. The capital, as you know, was raised by the issue of 100,000*l.* 10 per cent. bonds, to be paid off at fixed periods, &c. This was not found agreeable to the original shareholders, who proposed to the bondholders to give them preference shares of 15 per cent. in perpetuity for their bonds, and thus save the payment of 10,000*l.* a-year, as agreed, in reduction of the 100,000*l.*; 70,000*l.* of the bondholders, we are told, have wisely accepted the offer, and only left bonds or mortgage on the whole of their property to the extent of 30,000*l.* A new board of directors from the new shareholders has been elected, new winding-engines are in course of erection, and the heading in to the Blakeley Hall coal, from Bromford Pits (the property of the company), being pushed forward as fast as possible.

Mr. Reuben Plant, Wordsley, near Stourbridge, well known in the world as a good mining man, has exchanged 30,000*l.* of his bonds for preference shares, and has become a director of the company, and should he drive this colliery forward with as much vigour and economy as he did the collieries he held under Lord Dudley the bondholders and the shareholders will have great cause to be pleased with the change they have made. In conclusion, I hope those directors who know nothing, or next to nothing, connected with colliery matters will not attempt to thwart the man who holds so large an interest in the company, and is well calculated to make the best of it.

A Well-Wisher to the Coal Trade.

Birmingham, Feb. 23.

IRON AND COAL IN NEW SOUTH WALES.

Sir,—Although it is rather lengthy, I enclose you herewith Prof. Liversidge's paper (as read at our "Royal Society") "On One of our Iron and Coal Deposits on our Western Line of Railway." It has this special advantage for men of business, that it is a quasi-official report, and, therefore, free from misstatements or over-coloured details, such as are apt to creep into mere mining reports, either through interested motives or the want of scientific knowledge. From its proximity to the "line," this deposit has had special attention given to it, and is likely soon to be worked; but there are several other known large deposits in the colony, some of which will be also intersected by extensions of our western, southern, and northern lines within the next eighteen months.

At Brown's Creek (running parallel to the 40, 50, and 100 ft. lodes of gold-bearing wash and reef) there is a 15-ft. vein of iron; also at Bogolong there is a still larger one, a smelted pig from which is now in Sydney, and samples from it sent by me to you and also to Berlin. On the A. A. Company's estate, near Newcastle, large seams also exist, and outcrops about 100 miles up the northern line. Within a short distance of Sydney itself, on the north shore, the surface indications of iron lodes are numerous, and I have just been told that there is a "blow" of rich ore, several feet across, about 10 miles off, and close to water-carriage.

Late discoveries of the dip of our coal measures, and stratification of the rocks north and south of Sydney, give us every reason to believe that coal also lies beneath us, at from 800 to 1200 ft.; and as soon as I get the concession from the Government to work under the harbour reserves and the harbour of Port Jackson itself, boring will be commenced to test the assumption; and as the iron and coal measures are mostly found together here, should I succeed, Port Jackson will be able to load a 3000-ton ship in three days,* at a gross cost of about 7*s.* per ton, whilst the "smalls" will smelt iron ore, if also found, and Sydney will necessarily become a Glasgow and Newcastle in one.

New South Wales owed its first prosperity to its sheep-farming, and next to its gold fields; and all other kind of mining was left to isolated efforts, and, therefore, when the late "mining mania" set in swindling prospectors, ignorant shareholders, and incompetent managers brought "mining" to such a pass that universal distrust followed upon wide-spread losses; but, as we are exporting copper and tin largely—and lead, silver, antimony, cobalt, plumbago, platinum, and other minerals are known to exist—and last, though not least, coal and iron in apparently inexhaustible quantities, there is no fear of the future success of mining under honest and skilful management in New South Wales. R. Adams.

Sydney, Dec. 21.

[Mr. Liversidge's paper is an elaborate and highly interesting one, and an early opportunity will be taken to publish it in the Journal.]

* Messrs. Fulton and Co., of Dunedin, New Zealand, lately brought out the ss. Hasby, of 2500 tons burden, for the coal trade especially between the two colonies, and, as I get her loaded in Newcastle in from three to four days, the coal having to come by rail some few miles, Sydney, with its superior advantages of deep water and shelter, and the coal (when found) raised direct from the pits into high "plats," and loaded thence direct through the shoots (in an endless moving incline, to save breakage), ought to do it in even half that short time.—R. A.

ROCK-DRILLS.

Sir,—Your correspondent, Sir George Wm. Denys, is entitled to the thanks of the community interested in mining. I have read with considerable interest his letter in the Supplement to last week's Journal as a plain statement of facts and considerations.

For some years rock-drills have been anxiously watched by myself and friends, and our trial at Wheal Agar, Pool, Cornwall, is the result. The strata are granite overlaid by killas. The vein or lode on which we are sinking is a very hard tin capel, at present composed of hard spar and harder tinstone, in which to sink by hand-borer and mallet eight borers have been blunted in boring 6 in., and nearly as many hours spent. Our shaft is 186 fms. below adit, and upwards of 200 fms. from surface, and is 7½ ft. by 12 or 14 ft. long, the lode or vein being the whole width of the shaft. The water coming from the bottom is not great, but is considerable at the 150 and 170 driven east. The pumping-engine is a 70-in. cylinder—pitwork 15 in. to the 70 fm. level, 13 and 12 in. below—working 4½ strokes per minutes. The whim-engine is a 24-inch double-acting one, of 7 ft. stroke—the ordinary Cornish whim-engine. To this engine we have attached an angle-bob, which compresses the air to 60 lbs. per inch, and draws a large kibble of stuff, containing nearly 1 ton, with a pressure of 22 lbs. per inch of steam on boiler.

Our compressor is double-acting, on the wet principle, the drawings of which were supplied by Mr. John Darlington, of Coleman-street Buildings, Moorgate-street, London, who will be happy to supply similar compressors at 90*l.* each. The compressor has a diameter of 12½ in., and stands 6 ft. 6 in. high. The compression increases ½ lb. per stroke of engine, and continues to accumulate to over 60 lbs. when the drill is working, so much so that if we are not drawing stuff the engine is stopped every few minutes, or the valves are forcibly kept open to prevent compression. Our idea is that we can easily work five or six drills by this compressor, which is capable of delivering 55 cubic feet of air per minute, at 45 lbs. pressure above the atmosphere, working 20 strokes per minute, which speed can be increased if required. This quantity of air is sufficient to drive four drills at the same time, as each drill consumes only 43 cubic inches of air per double stroke.

The air-receiver is an old tube of a boiler, 30 ft. long by 3 ft. 6 in. in diameter, to which ends have been put. The air-pipes are wrought-iron, of 2½ in. in diameter, screwed together as ordinary gas-pipes, with flanged joints at intervals to enable us to disjoint them. The leakage is a mere nothing, the pressure gauge standing at 60 lbs. for some time. The drills are supplied by Mr. John Darlington, which for simplicity, lightness, economy, and effect have commended themselves to us, as they must to all who appreciated the efforts to render machine boring successful. The cost is 65*l.* each, but should the demand equal the merits of the drill we may reasonably hope that at no distant day they will be supplied at 50*l.* each. In this matter I do not agree with Sir George Denys. I fail to recognise worth in high price. The greater the simplicity, the cheaper and the more profitable to the manufacturer or patentee.

For the encouragement of other mines similarly situate as ourselves, let me say that our two machines at 65*l.* each, 250 fathoms of 2½ in. (within) gas-piping, compressor, air-receiver, &c., complete, did not exceed 400*l.* Had we but one or two drills working the erection and trial are justifiable, as our monthly cost is 300*l.*, which really in our case represents the cost of sinking 1 fathom per month at the shaft. If we can succeed by the consumption of 1 ton of coal extra per day, and by the outlay of 400*l.* in sinking 1 fm. per week, we reduce the cost from 300*l.* to (say) 100*l.* per fm. Doubtless our true interest lies in availing ourselves to the fullest extent of the power at our command, or otherwise we waste our resources. We purpose forthwith to put another drill in the 170, and as soon as we reach the 190 to cross-cut north to intersect three other lodes.

The result of shaft sinking by rock-borers, being the most difficult of operations in mining, is awaited with great interest. Of their capability for driving levels and cross-cuts there exists little doubt. Our experience is that they are equally as effective in shaft sinking. At Wheal Agar this day 5 ft. was drilled in two holes, the lode being very hard, abounding in cross-heads and joints, in less than an hour, and this by shaftmen who had never before attempted to use the machine. From this result none can question its adaptability. The greatest care is required to keep your machine well cleaned and oiled, your drills true—head and point, your compressor well supplied with water, and well packed. These conditions observed, and until force ceases to be force we need not doubt the result, if but properly directed.

The crisis in Cornish mining must awake the sleeping talent in every mining agent, or his situation may speedily be vacant. We may here refer to the adoption of blasting by electricity at Wheal Agar. Any number of holes can be fired at the same time, and but one explosion is heard. There is no idle time waiting until the slow fuse does its duty; it is no sooner said than done, and the men return to their work devoid of fear. Such are some of the changes which are tending to the amelioration of the miner's condition, and let us hope others of as great a benefit to employer and employed will follow, that it may be said the occasion has been met by the man and the means. I thought it necessary to go into detail as to the depth of the mine, the hardness of the rock, &c., which I regret Sir George Denys did not, thereby enabling those who have no knowledge of the district to form an opinion. I presume Sir George Deny's mine to be in the limestone, none of which I have ever seen to be compared in hardness and difficulty of breaking to that we are now operating upon—the capels of a large tin lode.

Wheal Agar, Pool, Cornwall, Feb. 22. H. Waddington.

ROCK DRILLS.

Sir,—We observe in the last two issues of the *Mining Journal* several letters having reference to Messrs. McKean and Co.'s advertisement of an experimental rock drill, at 35*l.*, to test the principle of their machines. Your correspondents appear to look at the matter in its proper light. It seems rather improbable that intending purchasers of rock drills would care to pay one-half the price of a proper machine for a plaything, from which no true results could be obtained, and which would probably, as Sir Geo. W. Denys, in his letter, says, be "smashed up in 24 hours" if put to actual work in a mine. If makers of rock drills could conscientiously recommend a customer to purchase, in the first instance, one of these experimental drills, no doubt it would be to their advantage to do so, as they would realise a double profit if the ordinary machine was afterwards sold. We believe, however, that in almost every case a purchaser would much prefer to pay an extra 30*l.* or 40*l.* to start with the proper machinery. Until we are convinced to the contrary, we shall not ourselves recommend an experimental rock drill, though, of course, we should not refuse to supply one if a customer desired it.

Chas. Harwood and Co.,
Sole agents for the "Levet" Rock Drill.

St. Stephen's Chambers, Moorgate-street, Feb. 23.

ROCK-DRILLS.

Sir,—There have been several letters of late in your valuable Journal with regard to the advisability of makers supplying working models of their rock-drills at reduced prices, in order that purchasers may test the principle before buying the full-sized machines. I can understand that in cases where the difference in price between the model and the actual machine is very considerable intending purchasers might prefer to buy a model; but I do not think I should find many who are responsible for the working of mines to spend 35*l.* on a model when they could buy the actual machine for 75*l.*, which is the price of my No. 1 sized Kainotomon. I think that if intending purchasers will not be convinced by the fact of my machine being used by the British, Prussian, and Saxon Governments, and in a large number of the most important mines, quarries, and works in this country and abroad, they are not likely to arrive at the real value of the machine by experimenting with a model. If I am mistaken, I, and no doubt other makers, will be ready to supply working models at 35*l.*, or even less. I cannot, however, bring my mind to recommend what appears to me to be a useless expense.

With the exception of "J. G.," my opinions appear to be those of your correspondents, even of Sir Geo. W. Denys, who has had considerable experience of the McKean drill (*vide* the P.S. of his letter in last week's Journal).

I may mention that the price of the air-compressor, with steam-engine complete, which I supply to drive one No. 2 size Kainotomon rock-drill is only 85*l.* Thos. A. Warrington.

King-street, Cheapside, Feb. 24.

ROCK DRILLS.

Sir,—Your correspondent, "A Working Miner," seems to have a great personal hatred to the mining captains—for what reason I would not suggest, unless he is like a thousand and one individuals besides, who rejoice with them that weep, and weep with them that rejoice. If the mine captains are not more intelligible than his communication their intelligence might be justly spoken against. Before anyone attempts to cry down the education of another he ought, at least, to be able to write intelligibly, as well as good English. He says—"From my experience I am inclined to maintain that the working miners are much more intelligent, as a rule, than the mine captains; and it is to this fact that I attribute the excellent reputation enjoyed by Cornishmen in foreign countries as mine managers, and the ignorance of the mine captains in Cornwall." To what "fact" does he refer? Does he wish your readers to take his opinions and statements as facts? Doubtless he does. But suppose we take them as such, to what "fact" does he "attribute the excellent reputation enjoyed by Cornishmen in foreign countries as mine managers, and the ignorance of the mine captains in Cornwall?" From what class of individuals are the foreign mine managers taken; are they taken from among the working miners, or any other class of men? Anyone would infer from his facts (?) that they were taken from among the working miners, and that those in Cornwall and Wales were taken from the former, or some other class of men who know quite as little of mining.

Your correspondent, who is an expert in the science of mining economy (?), thinks that it would be economical to pay him 7*l.* 10*s.* per month to drive a level with a rock drill, and he goes on to show us how it can be done. At the commencement he tells us that "a drill ought to do 250 fms. of drilling before getting disabled, and, allowing for putting four holes in the face or platform (unintelligible terms, but I take them to mean the breast or bottom) before blasting, this would represent 60 fms. extension." I am glad, Sir, that our working miners are not so ignorant as to imagine they can under every circumstance bore four holes in an end or shaft with advantage before blasting, especially in ground of 5*l.* per fm.—much less would they think four holes so bored would extend the end or shaft for the distance of the boring. Supposing that the holes were a yard in length, or any other measurement, they must be bored in the end horizontally, or in the shaft perpendicularly, and then cut to the very bottom, in order to extend the end or shaft to the full measurement of the holes. I have never yet seen a miner, either in Cornwall or Wales, so silly as to make such an attempt. So much for his knowledge of cutting ground.

Let us see, in the next place, how much experience he has of the rock drill itself. He refers to the drills at the Hoosac and St. Gothard as driving 10 ft. per day. I would tell him for his information that there is no analogy between these tunnels and ordinary level driving and shaft sinking in mines; and, therefore, were he to take his contract of 60 fms. to drive in three months, he would find out his mistake. And were he to pay for the erecting of all the things necessary for the working of his drill, as well as the drill itself, he would find in the end his 300*l.* would be nearly swallowed up before a fathom of ground were driven. I could point him to a place where one of those famous playthings cost nearly twice that amount without extending a single foot. He puts down 145*l.* as being excessive for the drill, &c. I will take his own figures as the advertised cost of drill and compressor. Now, who does he think will pay the freight of those things from the place of manufacture? And who does he think will pay the putting of them up? Does he expect that Mr. McKean is going to do all this for the advertised cost of the machines? And does he expect that the air compressor will compress air of itself? Surely, he must be diseased with an intellectual jaundice or idiosyncrasy of the brain. He says nothing of the cost of this engine, coals, grease, or engineer's wages, or of a reservoir to contain compressed air. And after this amazing display of ignorance he says that whilst we have the present class of captains we shall have no prosperous mines, &c. I hope that, should he favour you with another communication, he will have a little more respect for the judgment and commonsense of your readers. With many I shall hail the day when manual labour can be superseded by machine power in the driving of levels and sinking of shafts. I will now leave "Working Miner" at Wheal Prussia, and go on to look after my business at— Pedn-an-drea.

THE CHANNEL TUNNEL AS AN INVESTMENT.

Sir,—I have very carefully read the arguments of all the chief supporters of the Channel Tunnel scheme, and quite concur in the view that even 40 minutes burial in the darkness of the projected submarine railway would be preferable to the 90 minutes misery which has now to be endured in making the journey from Dover to Calais, and, doubtless, there are many like myself who would willingly pay twice the fare now charged by the steamers could the unpleasant sensation of sea-sickness be avoided; but when I look upon the affair from a commercial point of view the chances of success appear to me to be exceedingly remote. Having very frequently crossed at almost all seasons, I can affirm that the majority of regular travellers seem to enjoy the portion of the journey between the coasts much more than the tedious railway journeys between London and Dover, and between Calais and Paris respectively—so much so that many have told me they always travel by way of Newhaven and Dieppe for the sake of the sea-trip when they can spare the two hours extra which the long sea route involves. It is true that during the excursion season—July and August, for example—passages are frequently made when the vessel is more lively than half the passengers; but these are exceptional—generally two-thirds of the passengers are unaffected, and the remaining one-third are pacing the deck, cigar in mouth in the case of the male portion, enjoying the refreshing breeze, and acquiring an enormous appetite by the time they reach the opposite shore. Indeed, it is a curious fact that, although one is disgustingly ill the whole distance, his appetite is keen, and he can enjoy a hearty meal five minutes after landing as well as at any time in his life.

Now, as it is principally on the excursion traffic that the Channel Tunnel Railway would have to rely for the passenger portion of their revenue receipts, I thought I would try whether, assuming 3*s.* to be charged for the return journey through the tunnel, and the traffic to be equal to the excursion traffic between London and Brighton in the height of the excursion season. It is exceptional for the Brighton Company to take down in any one day ten trains with 1200 passengers each, yet this would give but 12,000 per day; and I find that the carriage of 12,000 passengers per day at 3*s.* a head, on the whole 365 days, will only yield a revenue of 657,000*l.* per annum, and that there is not one railway in England—at least I cannot find one—whose goods traffic would yield the 543,000*l.* of revenue which would still be deficient. Allowing for all probable increase, more than 365,000 passengers per year through the Channel Tunnel could not be hoped for, whilst more than 20 times that number, or 7,300,000 passengers and the whole of the Midland Company's goods revenue, would be required for the Channel Tunnel Railway to make it a success.

Under these circumstances, it is probable that very few English capitalists will be found so utterly wanting in judgment as to regard the project as a desirable investment, more especially as the contingency of a war between England and any continental power would have to be taken into consideration. In such an event, all guarantees of neutrality would be worthless—and the French, although undoubtedly honourable in the engagements they enter into, would be the first to drown the tunnel should the necessity arise, and the cost alone of pumping out a body of water 30 miles long and 600 square feet area would effectually prevent the restoration of the tunnel to its original condition, whilst the existence of the drowned tunnel would augment the difficulties and dangers of making a second one. Throughout France every bridge is constructed in such a manner that it can be instantly blown down when necessary for military purposes, and the French would certainly not be insane enough to neglect so wise a precaution in the case of the Channel Tunnel. But, even if neglected, a few days' mining and blasting would remove the difficulty, and render the tunnel worthless.

Feb. 24. Investor.

CORNISH, GERMAN, AND AMERICAN MINE AGENTS.

Sir,—Mr. Allen stated in the Supplement to last week's Journal that his means of observation have been somewhat extensive, having travelled throughout the counties of Cornwall and Devon, but before he made such a sweeping assertion as that Germans and Americans take the lead in the management of foreign mines he ought to have travelled much further. Now, Sir, I have travelled through thousands of miles in the United States, and in other countries, and am prepared to affirm that such is not the case. It is quite natural to suppose in a country like the United States, and where United States capital is employed in the working of mines, that the financial or general agent, as he is called there, should be one of themselves, which is almost always the case, and the mining superintendents, whether English or German, are generally subordinate to that functionary, but much in the same sense as many managers are subordinate to pursers in Cornwall. Germans more particularly are employed in metallurgical operations, amalgamating gold and silver ores, &c., and those only of them who had some previous experience in that line in their own country, and who graduated at Freiberg. A great number of whom armed with credentials from good authorities are available in that country. I have never known a German working miner rise to a first, or even to a second, class position there, and I very much doubt if they ever do in Germany. But in Cornwall and other parts of Great Britain they do. Whence this difference?

Again, I have never seen Cornish agents in that country in quest of office, and it is a little too much to expect the Germans or Americans to come to England to engage mine agents. What Mr. T. H. Allen says respecting the complaint of some returned Cornish miners from America, who stated they might have obtained situations if they had not lacked certain qualifications for office, meant, I presume, that they might have been made foremen—a position somewhat akin to that of gangers on railroads and some other open works in this country where men are employed by day-work—if they had been able to write and keep account of the time. It never was the wail of any mine agent from this country that he failed to obtain a situation there because he lacked the necessary qualifications to properly discharge the duties of the office. Mr. Allen admits that Cornishmen as miners are superior to any others; but it is only, he alleges, in the mechanism of emperic art they have no brain, or, if they have, they are ignorant of the uses to which that

distinguished organ is applicable. I take it, Sir, that the man, or class of men, who are practically superior to others are absolutely superior; that is to say, that superiority in the analytical sum of the difference between them—a fixed quantity which sophistry can never remove. I readily grant that if the Cornish had, in addition to their peculiar experience, the scientific or educational knowledge of the Germans, it would improve them very much; and, *vice versa*, if the Germans had the Cornishmen's practical ability to execute they would be equally improved, and a little more so. The question arises here, which of the two is best for all pratical purposes? and, so far as Mr. Allen is concerned, his censure to the contrary, notwithstanding his verdict has been recorded in favour of the Cornish, but with a sort of qualifying addenda, that they are, nevertheless, inferior, because, as he asserts, they are not familiar with "abstract principles."

Now, as to these. What are the abstract principles he refers to? I was not aware that principles were abstractions, or that they could be abstracted, if, as I understand, the term abstraction means a something taken from something which remains. Abstraction, I understand, deals with attributes, and when it has exhausted these the principle in which they inhered remains. This residuum, after an exhaustive process of abstraction, may be his abstract principle. Will he be good enough to define it? But if he meant no more than that mine agents should be familiar with the attributes of all the objects and principles which give being and properties to objects with which mining is inseparably associated, he has marked out for them a goal to which no man has yet attained. The acquirements and attainments of Sir Isaac Newton scarcely brought him within the vestibule of this temple of knowledge. To talk of abstract principles, which primarily include *principia essendi*, or the principles of being, as a necessary qualification to efficiently direct the operations of mining, is a piece of lofty transcendentalism which I never expected to be regaled with in the columns of the *Mining Journal*. But, possibly, I may have taken an exaggerated view of the gentleman's meaning. He may not have intended that it was absolutely necessary as a qualification that mine agents should be familiar with the "abstract principles" of either matter or mind. He will favour us, I hope, with an explanation of what he intended in next week's Journal.

EX NIHILO NIHIL FIT.

AMENDMENT OF THE PATENT LAWS.

SIR,—In regard to your remarks on the Lord Chancellor's Bill, perhaps the following observations I have just forwarded to his Lordship will be worth consideration, as they will show that as the Bill stands it needs modification in order to prevent its effecting more harm than good.—*Gray's Inn, Feb.* 25. F. W. CAMPIN.

OBSERVATIONS.

The intention of this Bill is worthy of applause, it being evidently framed with the view to deal out evenhanded justice to inventors and to the interests of the public, real or supposed, as far as they are considered to be antagonistic.

But if some of its clauses are passed unmodified into law a fatal blow will be struck at the progress of invention in this country, inasmuch as the operation of these clauses will strongly tend, in a very considerable degree, to discourage inventors from bringing into public notice and industrially developing their inventions, especially in those numerous cases where inventors have to act with money supplied by others in the very outset.

The clauses named in the margin are objectionable on the following grounds:—

Clause 6.—Passing by the practical objection that two to four examiners, as named in this clause, cannot, according to the opinion of competent judges, be sufficient for the proposed work, it must be said:—

Clause 7.—That the referees would be objectionable, inasmuch as, not being paid officials, they would be to a great extent irresponsible, and since, if they are to be of any real value, they must have had practical dealing with matters of invention, they will, unless superhuman, be biassed, perhaps even venal; and although a safeguard is provided in the form of a declaration of non-interest, this must in the very nature of things be of little avail.

Clause 8.—The requirement in this clause of a full specification at the time of application, *unless great facility be given for amendment, and also for additions*, will be a serious objection, for it is well known that inventions do not come into the world as Minerva sprung from the head of Jupiter—fully equipped at all points—but are first conceived as to principles and characteristics, and then elaborated as to working details by practical experiment, for which our law has hitherto made some provision by allowing time between the filing of the provisional and final specifications.

Clause 10.—What is stated above as to referees will apply here.

Clause 11.—The examination, as regards sub-clauses *d*, *e*, and *f*, will prove most prejudicial to the recognition of the claims of inventors, *f* particularly so.

The power to any man or set of men to decide the *worth* of an invention, such as is given by this clause, before the invention has been practically tested in the workshop, or by actual industrial use, is one that those who know anything about inventions must at once acknowledge as most arbitrary—moreover, a power that cannot be used without the recurrence of frequent mistakes and much injustice.

No examination, *in limine*, can fairly be hoped to be equal to the decision of anything beyond "novelty," which is often very difficult to decide, as is evidenced by by the trouble and difficulty attending patent lawsuits, which, be it noted, take place *after* the invention has been brought into practical use, and can, therefore, be judged of by practical results.

However, I am not prepared to say that an invention, which appears to competent examiners and referees to be legally not a fit subject for a patent, and *positively worthless* and *frivolous*, should not be subject to have their opinion to that effect notified to the applicant, and placed on record as information to the public. It might be possibly said that this would be desirable, and I cannot say it would not, but *in any case the applicant should receive his patent*, if he still solicits it, subject to the above. This might lead to the abandonment of a large number of objectionable patents, and it may be safely predicted that when an adverse opinion would not be a positive rejection the examiners' opinion would very freely expressed.

Clause 12.—This clause, which refers to a reference to the law officer *in all cases*, is, I would most respectfully submit, undesirable, and I would suggest that the reference to the law officer should be restricted to those cases where the applicant contests the examiners' decision, or an opponent appears.

The law officers have so much other important public work to do that they have not time to spare for this, and they are not appointed in regard to any special fitness for dealing with patent matters.

Clause 13.—The requirement of a notice to proceed *after* the examiners' report and law officers decision seems to be a mere formality, serving only to give trouble to inventors.

Clause 16.—This, which is copied from the Act of 1852, has always been considered, as far as the limitation of the claim to seal a patent under a warrant more than three months' old is concerned, as of little or no value, except as a stumbling block to inventors. The limitation of sealing to seven days before expiration of provisional protection will, it is feared, be found very objectionable. Any protection it might afford against "racing" to the Great Seal might be more directly provided against.

Clause 19.—It is suggested that the representative of a foreign patentee, duly authorised by a power of attorney, be allowed to obtain a patent as well as the foreign patentee himself.

Clause 21.—The terms of this clause, which are intended to authorise amendments, are so stringently restrictive that no practical advantage could possibly be obtained under same.

Moreover, almost all other Patent Laws than those of this country allow not only *amendments*, but *additions* of *subsidiary practical* details to be made, and it would be of immense benefit if this were allowed, at all events during the progress of the patent. Indeed, this would be the only way to render the requirement of a full specification in the first instance tolerable.

When amendment is refused to be allowed there ought to be an appeal permitted; this is not expressly provided for. The fee or stamp for amendment ought not to exceed 2*l*.

Some of the other clauses are open to objection (such as the proposed compulsory licence clause), but most of them relate to undoubted improvements in the law.

The schedule of stamp duties opens up this grave consideration, that whereas the majority of inventors being poor men (artizans being often inventors) yet no sensible reduction of cost is proposed. And as it is the first step that is particularly required to be cheapened, I would suggest that for *One Pound* a caveat should be allowed to be entered, which should be accompanied by a descriptive declaration, and that no patent be allowed to pass in derogation of the caveat on an application for patent subsequent to entry of caveat, same to hold good for three months, and not to be a publication of the invention.

CORNISH MINING.

SIR,—It is long since I had this pleasure, and now address you on a subject which concerns "One and All," and the public generally. The present depression in this particular enterprise is attributable to a variety of circumstances, not the least among which is the importation of foreign tin, or, in other words, the supply being in excess of the demand which regulates the market value of mining property. It has been my lot to witness several such "depressed times," until the barometer has fallen so low as to check the inflow of foreign metals, which must now be inevitable. I, therefore, venture to predict that ere long the desired and much-needed reaction will take place, and cause this enterprise to enhance in market value double its present price. On such occasions as the present, although the public seem to be aware that there is very little risk in launching out a little capital, still they lack that boldness necessary to secure for themselves what they are convinced is within their reach.

There are several mines in the county about paying cost, which, on a rise in price of tin taking place, must shortly enter the Dividend List. It is such mines as these that I draw capitalists' attention to, and further to warn them against old worn-out deep mines, which will by-and-bye be brought to their notice through the medium of prospectuses and advertisements requiring a large capital, not so much for the development of the property as to pay the promotion money. As a rule, in such cases, the larger the capital the larger the amount of "plunder." Probably there has been more riches made out of the mines of the district in which I now write this than any other in England comprising the same area; and still I venture to say there were never so good as what yet may be found so good again, particularly in the development of the new ground. There are some being carried on in a very unostensible manner, very little at present heard of, which can boast of having a lode of tin, about 40 fathoms from surface, 12 ft. wide, and worth 100*l*. per fathom, selling for about one-half its value. There are several such mines in this state, requiring only the turn of the tide in the price of metals to put them in the Dividend List, and consequently enrich those who have the spirit to invest a little of their surplus cash.

St. Day, Scorrier, Cornwall, Feb. 25. C. BAWDEN.

THE WOTHERTON TRACTION ENGINE.

SIR,—I fancy the residents will agree that your correspondent, Mr. Yelland's, knowledge of the neighbourhood of which he writes is not very extensive or accurate if he says Lord Powis opposed the Rea Valley line, which passed by his mines, simply because it passed through wet gravel, which certainly did not come to the surface during the costly and exhaustive proceedings for and against the said line before the House of Commons Committee. The Minsterley-road, of which he speaks, was made by the owners of the lead mines, chiefly Mr. Bridgman More, aided by Lord Tankerville and the Marquis of Bath. The mining companies, however, do not run traction engines on this road, nor is any rate charged to anyone for its repair. The railway being only four miles from the barytes mines, and Lord Powis and Sir O. Wakeman being the two chief landowners as well as mineowners of this district, it only remains for Mr. Yelland to induce his aristocratic friends to move the said railway on to earn the thanks of the ratepayers and the best wishes for his mining success.—*Feb.* 22. CAMBRIENSIS.

SUCCESSFUL AND UNSUCCESSFUL MINING.

SIR,—I have up to the present read all Mr. Skewis's communications on this subject, and cannot yet glean from them anything that enlightens the mine adventurers, agent, or miner: all his remarks appear to me to be well known—indeed, the only information new to me is that of a pack of harriers being kept on a mine, and the sump-house turned into a wine cellar. I presume this to have been in the time of Cornwall's great prosperity, when dividends came in so fast, and mining generally so profitable, that if a few individuals were lavish in their expenditure one cannot be surprised at it. I, for one, should like such good old old times to be renewed.

In the Journal of Feb. 13 Mr. Skewis goes into the incapabilities of some mine agents. Without endeavouring to rebut his charges or insinuations that there are such agents, I would again remark that almost every agent in the two counties must certainly possess a modicum of ability or he would not be appointed, and, in my opinion, there is scarcely any occupation more exciting and incentive in the two counties than to be a successful mine agent. I hope Mr. Skewis will not consider I am writing too strongly, or that my remarks should be considered as having any personal feeling towards him, and if not suggesting too much I would like to have his views as to mining in future—as to the best method of inducing capitalists to invest their money in Devon and Cornish mining, his views on Limited Liability and the Cost-book System, which is best adapted to the two counties, and what is his opinion of that old institution, the Stannary Court; and as Mr. Skewis appears well informed in mining history, he could not employ his pen to greater advantage for mining than to agitate for an alteration of the Stannary laws suitable for the requirements of the present time, so that instead of mining adventurers dreading the very name of the Stannary Court might seek its precincts, and obtain redress for their grievances in equity as well as in law.

Before concluding, I cannot help referring to the letter of Mr. T. H. Allen. Is it possible that he is a Cornishman, and that he gives the palm of theoretical and practical mining to Germans and Americans? I have always understood that Cornishmen as miners stood foremost in the rank among all nations. I should like to make a few remarks as to "A Cornishman's" views of the duties and capabilities of the efficient mine agent, also a few comments on that individual of many dark-painted colours—the promoter of mines—but must defer them until my next. S. CLARKE.

Feb. 23.

EAST BROOKWOOD AND BURCHETS COPPER MINE, BUCKFASTLEIGH.

SIR,—About from eleven to twelve years since I had permission from the owner of Burchets to sink pits, to endeavour to find the continuation of Wheal Emma and Brookwood copper lode. Previous to this, and during the time Wheal Emma was in the zenith of its prosperity, Capt. Dunstan, or one of the nine agents that had been engaged at Wheal Emma, costeaned a part of Burchets unsuccessfully, by having the pits sunk too far south, and did not find the lode. The miners employed by me were more successful; by sinking a shallow shaft north of the former trial pits they cut into a splendid lode of copper. Soon after this an accident happened to the landowner, which caused his death; and from that time until very lately I have been prevented from inviting anyone to join me—now, however, there is a treble opportunity. The freehold land joining Brook Mine east between the above discovery is offered to me, or to anyone nominated by me, for sale; the land, mineral, timber, and the right of the Murdle stream, with dwelling, smiths' shop, count-house, and out-houses. The mining setts now obtainable were held by the Brookwood shareholders, and a yearly rent was paid until the depression came, with the standard down to 80*l*., but now it is 113*l*. There has been nearly 200,000*l*. worth of copper sold from a short and shallow piece of land, consisting of Wheal Emma, where the discovery was made. It may be seen that Brook adventurers have been more fortunate than the Emma, having received back 12,500*l*., and sufficient copper has been sold since the last meeting to pay the usual dividend, and perhaps more. The mine proprietors are principally living in and near Liskeard. A public report only appears after the meeting; it can be seen in the Supplement to the *Mining Journal*, p. 1285, Nov. 21, 1874. In the same copy the sale of copper can be seen, and the price was just equal to South Caradon; the next sale may be seen in the *Mining Journal* of Jan. 23 to be 155*l*. 17s. 6d.

The first discovery made in Wheal Emma caused a rapid rise in the shares, inasmuch that the mine was divided into 4000 parts, and shares found *bona fide* purchasers at from 20*l*. to 26*l*. each. There was nothing to be wondered at in the price, for the abundance of copper found in the 6 fm. level, with the price the copper fetched, enabled the tributers to earn 30*l*. per month. I can produce a *Mining Journal* with the letting of tribute at 2s. in 1*l*. After all the produce and extraordinary price some of the copper sold for, it appears by the unfortunate circumstance of dividing the sett, which was held by one proprietary, caused fearful disputes, dissensions, &c. My object in mentioning the above is to show that it is a mineral district, and deserves being explored. The following is a report from one of the miners engaged by me in Burchets:—"I was one of the miners employed to sink, &c., and search for a copper lode in continuation east of Brookwood Mine. We were fortunate in finding a rich copper lode, and I believe that the discovery warrants my opinion that whenever it is worked there will be sufficient copper found for sinking the first 10 fathoms.—WILLIAM COLWELL, Hexworthy Cottage, Dartmoor."—*Ashburton, Feb.* 24. GEORGE SPARKE.

JAVALI MINE.

SIR,—The reports from Mr. J. Grant Maclean, stock and share broker, of Stirling, are highly interesting, and his able sketch of the mine in last week's Journal is decidedly graphic and very entertaining, but he has not done justice in his calculations of the profits, calling the shares 10s. per share. He states that with 30 stamps running the profits will be 30 per cent. to a purchaser at the above sum. Now, if he calls at the offices of the company, at St. Swithin's-lane, he will be informed that only 20 stamps are at work; therefore, to his 30 per cent. calculation (by the way a very low one, for the manager states, "every month we discover more valuable ground") he must add one-third more, or 33⅓ per cent.—*i.e.*, 40 per cent. profits at the price of 10s. per share. Javali will yet pay 5s. per share, or 50 per cent., when we consider all the riches it has already returned, and the coming prospects.—*London, Feb.* 24. READER.

JAVALI MINE.

SIR,—It is amusing to read the letter from "Savans," in reply to mine of Feb. 11, and the way in which he has endeavoured to escape from the mesh that he had unwittingly encircled himself. I made a statement that the return for the 12 months did not exceed an average of 290*l*. a month profit; this he does not contradict, but merely adds, "What will 'A Shareholder in Chontales' say to the returns by the last advice," as if this had anything to do with the point in question. Then, again, he does not say a word about the gross misstatement—that 5400*l*. had been made upon a capital of 9000*l*.—and why, because he has found out since, no doubt, that these figures are entirely wrong. Moreover, I did not dispute their average yield of gold per ton, but merely stated that, according to his former letter, it was always 10 dwts., whereas in the latter 7½ dwts. I do not deny that we are loaded, as your correspondent says, with a capital of 120,000*l*., but let me remind him that the Javali capital is nearly as great. I read a very good article on the latter mine in last week's Journal, and it contained the following particulars:—The writer says that the company have issued 43,609 (2*l*.) shares, fully paid up, 2486 preference, and a debenture stock of 9881*l*. These figures, which he states may be relied upon, as they are taken from official documents, make the capital over 100,000*l*.

Bristol, Feb. 25. A SHAREHOLDER IN CHONTALES.

[For remainder of Original Correspondence, see to-day's Journal.]

Meetings of Public Companies.

ENGLISH AND AUSTRALIAN COPPER COMPANY.

A general meeting of shareholders was held at the London Tavern, on Tuesday, Mr. R. A. ROUTH in the chair.

Mr. C. B. ROGERS (the secretary) read the notice convening the meeting. The report of the directors (which appeared in last week's Journal) was taken as read.

The CHAIRMAN said he thought all would agree that the report now submitted was a very satisfactory one in every respect. The company was now in a position of strength and advancement, the quantity of ore received from various sources during the last year having amounted to 13,627 tons, against 10,979 tons the previous year; and the quantity of copper made at the Port Adelaide Works was 2071 tons, against 1618 tons, and at the Newcastle Works 1043 tons. With regard to the increase of the ore, that had not been an increase in one particular, but a steady and gradual increase, the quantity having augmented from 3740 tons in 1870, to 13,627 tons in 1874. That to them was a most satisfactory feature, because, especially after the Burra Burra had been closed, they had for some time very great difficulty in finding other mines that would supply them with ore. This had necessitated a considerable increase in the works, which had indirectly affected the profits of the past year at Newcastle. Four new smelting-furnaces had been added, making in all nine ore smelting-furnaces and two refineries, and a new stack and culvert had been erected. There must be great interruption to the business during the progress of such works, but they were now completed and in full working order. Their smelting power, therefore, this year would be at its height, and as there was an ample supply of first-class ore for both their works, he thought he should not be considered sanguine when he said that the prospects of the company were extremely satisfactory. It was mentioned in the report that the owners of the new Lambton Collieries had laid down a new line of rail free of expense to this company, which considerably increased the value of the works as they stood. It fed the four new furnaces, and afforded shunting facilities for the old line; it would also feed any new furnaces that might be required, but their present furnace-power was ample to smelt even a larger quantity of ore than was at present being obtained. Had they realised during last year the full advantage of their present producing powers a very much better result would have accrued; but the result he thought could not but be regarded as satisfactory, considering the difficulties they had had to deal with. The total smelting power now consisted of 18 ore furnaces and four refineries, by which they could smelt up to 20,000 tons of ore per year. If, therefore, the price of copper kept as now a most satisfactory result should be shown at the end of the current year. They had everything that could be desired—the works were completed and paid for out of the working capital without calling upon the shareholders to contribute, and they were now in a position to carry on as good a trade as they could possibly wish. One material feature to which he wished to direct special attention was to the new source of supply of ore coming from New Caledonia. They had sent their captain to inspect the property known as the Ballade Mine, which yielded ore of the richest description, and from the surrounding mines there seemed very little question but that a most important mineral district was opening out that would be able to supply the Newcastle Works to almost any extent. According to the present developments this mine certainly appeared to be a most valuable property, and at the same time a most valuable adjunct to the Newcastle Works, forming as it did an almost entirely independent source of supply. They knew full well that they had strong competitors, but in this particular district they would have no competitors at all. Roads were being made by the French Communist convicts, and as soon as completed there seemed reason to believe that the supply from this source alone would be sufficient to keep the Newcastle Works in full operation. As far as could at present be seen there was opening out an entirely new mining district, yielding both carbonate and sulphuret ores, and this company had secured first contracts, and they hoped to keep the monopoly. The district was about 1000 to 1200 miles from Newcastle, and the communication was by water. A short railway would be brought to the creek from the mine. With respect to their wharf at Adelaide, the net earnings for the year again showed a satisfactory result. The South Australian Government intended to make an extension of the railway along St. Vincent-street to effect a junction with the rails on the wharf; when completed this would add immensely to its value. He had always spoken of this wharf as a valuable property, and it appeared to be still going forward in that direction. With regard to the Burra Mine, the deliveries of ore for the year had been 3246 tons, against 2945 tons in the previous year, and from what could be ascertained there did not appear to be any immediate prospect of substantial increase; he could not help thinking, however, but that capitalists would come forward and develope that property in depth. This company, as smelters, could not go into such a speculation, but his own private opinion was that the Burra Burra would be reconstituted, and become a good mine; if so, as their works were still there, this would be yet another source of supply of mineral. When this company was first formed the Burra Burra was the only mine, and their contract was made for the purpose of smelting their ores alone; but since then the development of the colonies had been such that there were now a great many sources of mineral. With regard to the profit and loss account, it showed a credit balance of 10,844*l*., to which had to be added 6277*l*. balance of profit on July 1, 1873, making together the sum of 17,121*l*.; out of this sum the twenty-third dividend had been paid, with the usual addition of 10 per cent. to the reserve fund, leaving at the credit of profit and loss 11,065*l*. From this amount it was proposed to pay a dividend of 2s. per share. The amount would have been considerably more had it not been that during the first half of the year the estimated profits really amounted to only 1000*l*. Therefore, the whole profit had actually been made in the last half of the year. If copper had kept up in price it would have made a considerable difference in their profits. He hoped the current year might prove a more profitable one. They had this evidence, that the stocks of copper on hand had been considerably reduced, as in 1872 they were 40,000 tons, in 1873, 63,000 tons, and in 1874, 29,000 tons, which pointed to the fact that there was not a greater production of copper than was consumed. Therefore, it was only reasonable to suppose that the price would be maintained. But there were other causes which might, to a certain extent, neutralise a diminution in the stocks. Looking, however, at the trade of the country, which appeared to be healthy, and looking also at the value of money, it seemed probable that, unless some extraordinary circumstances arose, this year would prove a favourable one for copper producers. As to the amount of proposed dividend, the directors, taking every fact into consideration, deemed a conservative course the more prudent. Hence their recommendation of 2s. per share; and since July nothing had arisen to alter the present favourable position of the company, and he hoped that by this time next year, considering the extension of business contemplated, the turnover last year having amounted to 246,000*l*., they would be able to show that a considerably larger profit had been realised than upon the present occasion. No effort would be spared on the part of the board, and he thought they might fairly and reasonably expect it would be so. He was only expressing the opinion of his co-directors no less than his own when he said that the company in every respect, financially and otherwise, was in a very firm and satisfactory position. He had been chairman of the board for many years, and he did not know that he ever recollected the company in a sounder or firmer position than now, or its prospects more satisfactory or encouraging. (Hear, hear.) He then moved that the report and accounts be received and adopted.

Mr. SPENCER HERAPATH seconded the proposition.

A SHAREHOLDER drew attention to the amount of capital locked up in the Koringa Works, which were totally unused, and suggested that something should be written off the amount; 1000*l*. had been deducted from the cost of the wharf at Port Adelaide, but he would rather see that amount deducted from the Koringa Works, because the wharf was likely to become more valuable, and bring in a revenue.

A SHAREHOLDER drew attention to the items paid for interest—234*l*. in Australia and 97*l*. in London—which was rather more than 30 per cent. of the net earn

ngs of the past year. He enquired what rate of interest there was being paid in Australia?

Mr. A. CORBETT (director), in reply to a question, stated that 6000*l.* of the floating capital had been expended on the new works.

Mr. SPENCER HERAPATH (director), in reply to a question, said that it was not possible to bring up the accounts more closely. They were sent out as soon as they arrived in England.

The CHAIRMAN said he had been desirous to have the accounts made up closer, but he found it impossible so as to have an actual account of realised profit.

The CHAIRMAN said, in reply to questions from different shareholders, that all unclaimed dividends after the second year were added to the profit and loss, but it had been the rule of the board to pay them if subsequently claimed. With regard to the property at Koringa, the directors believed it would some day become valuable; if the Burra Burra was resuscitated large profits could be made at those works, or they might be sold. As to the item of interest, that was to the board rather a source of congratulation than otherwise, because it showed what a large amount of business could be done with the limited floating capital; and as it was their operations were comparatively restricted on that account. The rate paid in the colony for interest was 8 per cent. The new works would not come into operation till July, but their full result would be shown during the current year. The sales of copper since last June would probably show a profit on the estimate.

Mr. WYLD enquired the rate of exchange between England and the colony?—The CHAIRMAN said it had been about 1 per cent. against them.

The report and accounts were received and adopted unanimously.

The CHAIRMAN then proposed that a dividend be declared of 2*s.* per share.—Mr. COBBETT seconded the proposition.

An amendment was proposed that the dividend be 2*s.* 6*d.* per share. This, however, was withdrawn, when the resolution was put and carried unanimously.

Messrs. Frewer and Routh, the retiring directors, were unanimously re-elected.

Mr. J. Viney was re-elected auditor.

A vote of thanks to the Chairman and directors closed the proceedings.

SILVER PLUME MINING COMPANY.

A general meeting of shareholders was held at the offices, Great Winchester-street, on Wednesday,—Mr. W. WADHAM in the chair.

Mr. T. ORCHARD (secretary) read the notice convening the meeting.

The report of the directors stated in October the vendors succeeded in obtaining an injunction against the company to stop working on that portion of the property known as the Silver Plume lode, from which the company was obtaining considerable quantities of ore. This injunction was granted in consequence of the Court refusing to accept the bond of the company for $20,000, which sum was decreed by the Court as security for any damages which might be awarded against the company; meantime, the profitable result of tribute working, as carried out under the very careful management of Mr. E. L. N. Foster, has been demonstrated, insomuch that the balance of the company's debt to the bank in Colorado has been paid off, and money transmitted for the office expenses in London. The working on the tribute system as approved by the shareholders was even more profitable in the present than last half-year, until the injunction obliged the company to work only on the Silver Star lode; even this portion of the mine, though worked by a small staff of men, is producing a fair amount of ore, and, notwithstanding obstacles issuing from litigation, the property is being carefully and successfully developed.

The last advises report that the lode in the second level, which had been lost, has been found by cross-cutting about 49 ft., and is 12 ft. wide, the previous discoveries not having exceeded 5 feet.

The figures show that during the past half-year, although interrupted in their working during the months of November and December, the tributers produced 143¾ tons of ore, gross value being 5432*l.*, which left, after mill charges, packing, hauling, &c., 1283*l.* gross for the company's proportion. From January to December there were sold 269 tons, of the value of 10,640*l.* 5*s.* 9*d.* gross. These results compare most favourably with those of the previous year (1873), during which the ore raised and sold only realised 702*l.* gross.

Mr. E. O. Wolcott, their American Counsel, was unsuccessful in compromising with the vendors in Philadelphia, leaving no option but the continuance of the suit, which, however, was postponed last term by the press of business of the Court, but will probably come on for hearing out of term. The directors are informed that this suit is a question of account between the vendors and the company, and that the ejectment suit has been withdrawn. The fact is now established that the mine is a good one, and the directors trust that should the present suit result in obliging the company to pay any further instalment of the purchase-money, the shareholders will in their own interest be ready to assist in finding the necessary funds.

The CHAIRMAN said the report to a certain extent was very satisfactory, in so far as it proved the mine to be a good one, and that if they continued to work it would probably before long be a paying property. The result of the six months just passed showed a balance of 326*l.* over the expenditure, which had enabled them to reduce their liabilities by that amount, and that in face of a great deal of expense that had arisen in the way of lawyers' fees, which they found to be very heavy in Colorado, and also a circumstance not mentioned in the report, that Mr. Foster had been obliged to develope the Hickman lode in order to secure it until the United States Patent had been granted for it. He thought they would see by the report the way in which they were acting—a certain amount of profit had been realised by working on tribute on the Silver Plume, but in that they had been stopped in October. As, however, this did not stop their works on the Silver Star, a certain amount of ore was returned from that mine, and a certain amount of profit realised. Since that report was sent out he was sorry to say they had received letters—he had only seen them that morning—from Mr. Foster, the agent. In one of them he says he was summoned to Central City for contempt of Court because Rufus Snider had sworn that they were still working on the Silver Plume. Mr. Foster also said that Snider had made an application for an injunction to stop their workings on the Silver Star, which application, he thought, would not be granted. However, he afterwards wrote another letter, which, he thought, had better be read, as it gave a fair account of the state of affairs at the present time.

Mr. ORCHARD read the letter, as follows:—

"I have just returned from Central City, and now sit down to inform you of the result of my journey there. On Tuesday afternoon the case for contempt of Court came up before Judge Belford, and was decided in my favour, as the judge said that at the time of granting the injunction he supposed he was granting an injunction on the whole of the company's property, but on reference to the papers he found that an injunction was only asked for the Silver Plume, and that he had only granted an injunction on the Silver Plume, hence we were not acting in contempt of Court by working on the Silver Star. On Wednesday morning the application for an injunction on the Silver Star and E. Hickman lodes, or appointment of a receiver for the whole of the company's property, came up for hearing before Judge Belford. Mr. Rockwell appeared for us, and argued our side of the question very ably, so that the judge did not feel justified in appointing a receiver, but granted the application for an injunction, hence all work will now be suspended on the company's property as soon as the writ of injunction is served by the sheriff. The judge has also ordered that evidence shall be taken in the final proceedings, and returned to him by April 15 prox., when he will decide the question, and should he consider that the company are not working the property to the best advantage of themselves and Snider he will then appoint a receiver to work the property under the direction of the Court. I know that the judge thinks that by working on lease we are working improperly, but I maintain that we are not, but that it is the only method by which we can expect to make profits. From the above you will see that my supply of cash is not cut off. Therefore, I rely upon you to keep me supplied so soon as what I have is expended, and from the accounts I shall send you in a few days you will see what cash I have in hand."

The CHAIRMAN added that as the mine was now shut down there would not be anything in the shape of returns, and until the lawsuit had been disposed of it would be necessary to provide further capital, but as the directors had not had time to consider the best course to adopt he thought the meeting should be adjourned. As he had said, this information only reached them that morning, and the matters therein referred to required consideration. He then moved that the report and accounts be received and adopted.—Mr. GRIFFITHS seconded the proposition, which was unanimously carried.

Upon the proposition of Mr. HERVEY, seconded by Dr. SMART, the re-election of Mr. Wadham as director was unanimously agreed to.

Upon the proposition of Mr. GRIFFITHS, which was duly seconded, Mr. J. Carr was unanimously elected a director.

A SHAREHOLDER said he represented Sir Frederick Perkins, who had instructed him to state that he believed the property to be a tangible one, and presented a fair outlook. Sir Frederick Perkins thought the directors deserved some compliment in the matter, and hoped by prosecuting the affairs, legal and otherwise, things would by-and bye come to a better result.

The CHAIRMAN thanked the shareholders for having re-elected him as director; it showed that they had confidence in the board. They had had unfortunate circumstances to contend against, but it had been proved that the mine, if properly worked, would become a remunerative property. They had yet many difficulties before them; but there could be no doubt that the people who sold the mine meant to do everything in their power to get it in their hands again. All the shareholders had to do was to defend their rights; in pursuance of that policy they had, under legal advice, brought a cross bill against the vendors, which demanded of them a clear and perfect title to the property. There was a technicality in the way, but the solicitor thought this course would have the effect, supposing they established any claim against the company, of compelling them to first settle the question of title. This would come on for hearing about the same time as the other; in the meantime the agent would be out of funds, and if they were to keep him there money must be sent him. The directors, in taking care of the property, and also of the shareholders, had advanced money out of their own pockets, but had not taken a single penny for their services. They were perfectly willing to pay their share towards the additional funds now required, and he thought the shareholders could not decline to put their hands into their pockets to defend their rights. As yet the board had no plan to submit, and he would, therefore, suggest that the meeting be adjourned (say) for three weeks, during which time they would get further information. Their legal advisers had a great deal of confidence as to the result of the suit, and would probably wait for a portion of the costs till the question had been decided. He thought it would be a melancholy spectacle if they allowed themselves to be robbed of what they believed to be a very good property. They bought it in good faith, and had acted in good faith, and it was their duty to try to defend their rights.

Mr. JOHN CARR also thanked the proprietors for his re-election. There seemed to be no doubt as to the value of the mine, and it was much to be regretted that the shareholders did not take more interest in the company by attending the meetings, and thus ascertaining the actual position and prospects of the property in which they held an interest. He confessed he was not much upset by the information contained in the letter received that morning. If the hearing came on in April they would then know the result. He thought if the shareholders could be induced to attend the meetings it could not fail to be of advantage to the company.—After some further discussion, the meeting was adjourned until March 24.

NEW HOBB'S HILL MINING COMPANY.

An extraordinary general meeting of shareholders was held at the offices of the company, New Broad-street, on Monday,

Mr. A. F. PAULL in the chair.

The notice convening the meeting having been read,

The CHAIRMAN explained that the meeting had been called for the purpose of taking into consideration the financial position of the company, and, if desirable, to pass a resolution to the effect "That the company be wound up voluntarily." This state of things was brought about by a large number of the shareholders in the old company having failed to subscribe for shares in the present company, to enable the company to pay its debts and develope as it was considered necessary and desirable. The present course was more to be deplored, seeing that by an economical arrangement of the machinery, and contracting with the labourers, it has been proved that at the present price of tin the labour cost could be met; so that by any reasonable improvement in the value of the metal, or in the quality of the ore stamped, good results would ensue.

The accounts having been adopted, it was resolved that the company be wound-up voluntarily, and that Mr. E. Beazley be the liquidator, and that the necessary confirmatory meeting be held at the office of the company on Monday, March 15, at 2 o'clock, P.M. In the meantime, the shareholders be invited to subscribe for the forfeited and unissued shares of the company, informing them that should a sufficient number of shares be subscribed for to warrant the directors continuing operations the resolutions passed this day be null and void.

SOUTH PRINCE PATRICK LEAD MINING COMPANY.

The second ordinary meeting of shareholders was held at the offices, Waterloo-street, Birmingham, on Thursday, Feb. 18,

Mr. JOHN WALFORD in the chair.

Mr. H. HOWELL (the secretary) read the following report from the directors:—

The directors have very much pleasure in presenting the accounts for the year ending Dec. 31. 1874, and in congratulating their fellow-shareholders at this their first annual meeting on the extraordinary success which has hitherto attended the operations at the mine.

The company was registered on Sept. 19, 1873; little more than 15 months have, therefore, elapsed, and within that period, as may be seen by the accounts, ore has been sold to the value of 2659*l.* 19*s.* 9*d.*, whilst the cost of raising, dressing, and management has been covered by an outlay of 854*l.* 1*s.* 10*s.* Your directors venture to observe that they believe such a result is without parallel in the history of any mining company.

Your directors were enabled to declare a dividend at the rate of 2*s.* per share on Oct. 18 last; and out of the disposable balance of 1005*l.* 17*s.* 11*d.* on revenue account, as shown in the accounts, they declared a further dividend of 2*s.* per share on the 23rd ult.

The unusual quantity of rain which fell during the months of November and December of last year, and the severe frost in the early part of January, very seriously interfered both with the mining operations and preparing ore for market; your directors are, however, assured by Captain Jones that with the return of good weather sales of ore will be resumed equal to, if not exceeding, those of last year. The operations at the mine have hitherto principally been directed to driving a level northward, and from the driving of this level the sales of ore have been made. The shaft near the northern boundary has been cleared out and enlarged to the depth of about 50 yards, and your directors are anxious that this shaft shall be sunk to at least 80 yards, when levels will be driven into the great Parry's lode, and there can be little doubt that large deposits of ore will be then met with. Instructions have been given that this work be proceeded with as speedily as possible.

The report and statement of accounts made up to Dec. 31 last having been adopted, a vote of thanks to the Chairman and directors was unanimously passed, and 100*l.* voted to them as an acknowledgement of the highly satisfactory and successful manner in which they had conducted the business of the company. A further resolution was passed fixing the future remuneration of the directors at 100*l.* per annum, so long as the dividends paid amount to 20 per cent. per annum.

Mr. Edwin Sunderland was elected a director to fill the vacancy caused by the retirement of Mr. Henry Sunderland, and Mr. George Beech was re-elected auditor.

A vote of thanks to the Chairman closed the proceedings.

GLAN CLWYD LEAD MINING COMPANY.

The first general meeting of this apparently very successful company was held at the Waterloo Hotel, Manchester, on Feb. 19. The proceedings, which were rather of a congratulatory than formal character, consisted of Capt. Kemp's report and Mr. W. H. Heap's (the Chairman) speech on moving its adoption, with the usual complimentary comments which characterise such assemblages when there is no fault to find, and everything is *couleur de rose*. One fact seemed to be brought out very prominently, and that was that, in spite of the highly satisfactory state of affairs, the directors give the whole of their services gratuitously, and charge the most moderate travelling expenses, being determined that no unnecessary weight shall fall upon the mine. We append the captain's interesting report, and a short *resume* of the subsequent proceedings.

Feb. 15.—I beg to hand you report on this mine for the first general meeting, giving an account of past and present operations, together with my opinion as to our future prospects. I feel this a very pleasing duty under the present favourable circumstances, for I must say that the success achieved since our commencement is by no means an everyday occurrence. We have procured a mine fully equipped with machinery, and levels driven for present and future use that must have cost our predecessors some 6000*l.* or 8000*l.*, besides the ten years or more of time they must have occupied in driving to open it up to its present considerable dimensions. Within 24 hours of our commencement we crowned the whole thing by cutting into No. 1 lode, and found it to contain rich bunches of lead. The following is the amount of work done underground since the commencement of our operations to the last measuring day—Jan. 30:—In the deep adit level 6 fms. 5 ft. have been driven; this level is being driven to intersect what is termed No. 3 lode, the out crop of which shows fine specimens of ore. The ground in this level is stiff for progress, but the lode will, I doubt not, well remunerate all future patience, perseverance, and expenditure when intersected. The footwall of No. 2 lode has been cut through; this is well defined, the lode bearing every indication of productiveness, being composed of carbonate of lime and sulphur, spotted with lead—a very healthy-looking lode. This has been extended 3 ft. on its western side, but operations are suspended temporarily in order to increase the supply of air, &c., when it will at once be proceeded with. On No. 1 lode 5 fms. 1 ft. have been driven east, and some nice lead gone through. The lode in the present forebreast is everything we could desire, being composed of clay-slate, carbonate of lime, and flookan. The flookan is full of small lead, and is letting out a great deal of water. I think with a few fathoms more driving we shall cut another channel of ore ground (coming down over our heads) which we know to exist nearer the surface. On No. 1 lode, over the deep adit level, 19 fms. 2 ft. 6 in. have been stoped. The ore ground has at times been 12 ft. wide, producing fine lead. It became disordered within the last fortnight (a fault or slide having intervened and severed the lead), and the lode became poor. This apparently untoward circumstance has enhanced rather than diminished the value of the lode, for in cutting through the fault we found the lode very much improved, and it has since produced the finest stuff we have yet seen. On No. 1 lode 9 fms. 2 ft. 6 in. have been stoped west of rise. Here we also have a splendid lode, fully 7 ft. wide, and a prettier sight cannot be seen than is there presented. On No. 1 lode 2 fms. 4 ft. 6 in. have been stoped east of rise. Here, again, we have a good lode, but seeing that it can be worked with greater facility from the back of the deep adit than from the rise, we have left it for the present.—Surface: The machinery, &c., of which you have full particulars in the inventory, is all very substantial, and in thorough working order. Above all, we have fine lodes to work on, and large piles of ore to commence washing at once. To sum up all, if indications read for anything, we shall have one of the finest mines in the Principality when No. 3 lode is intersected, and the old people must have had some idea of this great master lode, for the very field in which we confidently expect to cut it was called by them the "Erw Plum," or Lead Field. I will conclude by saying that our prospects are very bright, and that I look forward with great pleasure to seeing the shareholders at the approaching general meeting.—JOHN KEMP.

The CHAIRMAN, in moving the adoption of the report, said—You have just heard our secretary read a report in which I myself and you all may safely confide, supported as it is by those of the directors who have visited the mine every month since our commencement. It conveys to you in a clear and very interesting manner what we have been doing, and (with your countenance and aid) what we have still to do. We have, as far as the most practised eyes can see, a series of valuable lodes of ore, that only need bringing to the surface, besides strong indications of others yet uncut, but known to exist. It is not, as in most cases of lead mining, a mere "leap in the dark," we certainly can see what we can see, but beyond that, that which is unseen is not unknown, for we have an outcrop of metal that points like a finger-post to the bed from which it rose. Again, our predecessors have saved us an immense expense, and what is also of infinite value (especially to people who are inclined to be impatient, and expect lead to be dug up like potatoes) years of time in opening up the ground. This has in many cases shown us where the ore is, and in others they have saved us the cost, the time, and the disappointment of seeking it where it is not. We have all the machinery we shall need for some time with the exception of a stone-breaker. This myself and two of my brother directors have erected, and we hope soon to have it at work, and so bring into our exchequer the value of the heap of ore lying on the bank. The price of lead is highly favourable to us, and no time will be lost in getting a sample into the hands of the trade. It is my own conviction, and that too of several of our friends, that with such excellent chances before us a spirited and liberal policy should be adopted. We must not think only of just realising what can be easily and cheaply got. The mine must not be starved, and I think it would be in the interest of all concerned that we made an immediate call to enable us to carry out these views. The more men we can employ in the mine the more rapidly shall we be able to develope its undeniable resources. The deep adit level should be driven as fast as men and money can do it, for there we feel undoubted confidence lies the market lode of the mine. I am pleased to see the whole of our family together, or nearly the whole, two shareholders only being away. Our number is very small, and I was going to say very select. The smaller the better! We do not want to let too much of this get into the hands of the general public. The disposal of a few more shares will enable us to close the list and keep the thing compact, and well under our own control. Hoping to meet you next year under equally flattering auspices, I will now ask you to second the adoption of the report.

Mr. Councillor ROBINSON (Rochdale), in seconding the adoption of the report, begged to assure his brother-shareholders that from a thorough knowledge of the mine, acquired by several personal visits, during which he had closely inspected all the underground workings, he was prepared to corroborate every syllable of Capt. Kemp's report. He was glad to have the opportunity of bearing his hearty testimony to his zeal, industry, and perfect acquaintance with his duties. In him they had the advantage of the services of a thoroughly skilled miner, with the additional advantage of a special knowledge of this particular mine. He should feel it a duty, as well as a pleasure, to look narrowly after every item of expenditure, not only in their interest, but in his own. Although it was not legally necessary to present any balance-sheet at this meeting, one had been prepared, and could be examined by any gentleman so wishing. He had calculated the profits on their first four months' work, which shows (excluding, of course, books, law charges, &c.) 12½ per cent., or at the rate of 37½ per cent. per annum. He felt confident they had embarked in a sound and honest speculation, and he would do his best to prove it a successful one too. He with great pleasure seconded the adoption of the report.

Mr. Councillor BOOTH (Rochdale) in supporting its adoption, hoped the assembled shareholders would receive from the directors an assurance that a broad and sound policy of general development of their property would mark their management, and that with a strong desire to give them a handsome dividend they would see that the plant and workings be kept in a thoroughly efficient state, so as at once to ensure perfect safety to the men and ample room for the extraction of the ore.

After other confirmatory speeches the report was adopted *nem. con.*, and with a flattering eulogy of the secretary's services, and the ordinary vote of thanks to the Chairman, the meeting was brought to a very gratifying conclusion.

SOUTH GREAT WORK MINING COMPANY.

A general meeting of shareholders was held at the offices, Gresham Buildings, Basinghall-street, on Wednesday,

Mr. GODDARD in the chair.

Mr. G. SHARP (the secretary) read the notice convening the meeting, and the minutes of the last were confirmed.

The accounts showed a debit balance of 1828*l.* 13*s.* 11*d.* This was inclusive of the month's cost, payable to-day (Saturday); it was left to the shareholders to decide whether this amount should be charged up or not. The report of the manager stated that the mine never looked better, and from present indications it would soon become in a self-supporting condition. The report was as follows:—

Feb. 23.—In handing you my report for the general meeting I beg to say that the prospects of the mine as a whole were never so good as at the present time, and by a reference to the plans it will be seen that there are points shortly to come off which in all probability will place the mine in a far better or self-supporting position. The returns of tin have increased in the past few months from 2 tons to between 4 and 5 tons per month, until the recent floods broke in on the workings of the engine part; in consequence of this and the great length of the adit, being over four miles, the water was more than the adit could take off, and so formed a choke. This was a most difficult work to contend with. It is now accomplished, and permanently secured. At the flat-rod shaft the Orchard lode has been sunk on nearly a sufficient depth for a 45 fm. level, so that a short time would prove the other part of the mine; and, judging from the gradual improvement in the character of the lode from the 25 to the 35, there are fair grounds for believing that it will turn out increasingly productive in the bottom level. The lode at the flat-rod shaft is now worth 9*l.* per fathom.

In the 35 east a dropper or separate lode has formed a junction with the Orchard lode, and they are together fully 5 ft. wide, with tin mixed throughout. In the drivage west at this level we are now within 6 ft. of the dip of a good lode sunk on in a winze below the 25, and worth at present price for tin 16*l.* per fathom; the end is worth 6*l.* per fathom. This lode in the 25 east compares favourably for the long distance opened with the levels over it, and is being wrought at present by several pares of tributers. The lode in the 15 east is being entirely worked on tribute, and the lode in the end is worth 5*l.* per fathom. The engine-shaft has been sunk to the 20, or 35 fms. from surface, and levels driven westwards the junction of the Perran Downs and Richards' lodes, one of which has been met with, and two others now within a few fathoms of being intersected. The plan will show the exact position of these lodes falling in with the Great Work lode in an oblique direction, which is highly favourable for producing minerals in large quantities, as was the case under similar circumstances in the adjoining mine. The lode in the 20 west is large, and worth 7*l.* to 9*l.* per fathom. In a rise in the back of the level the lode is worth 13*l.* per fathom.

The plan will indicate the position of the Woodstock shaft, against which rises are being put up from the backs of both the 10 and 20 fm. levels, so as to effect a communication as early as possible. A very valuable lode for 6 fathoms in length has been driven over in the 20 (specimens of which may be examined), of a far richer produce than has been before seen in any part of the mine; this is under where the Woodstock shaft would come down in the 20, so that it could easily be explored below that level. Taking into consideration the shallowness of the mine with its several lodes, and almost immediate prospect of further new discoveries, it has recently been said by some of the best practical authorities who have seen it that few young mines hold out such good prospects of success as South Great Work. It is unfortunate that we have just now to contend against a low price for the produce, but with a return of an average of former prices for tin this mine would become a profitable undertaking. The costs in several important particulars are being reduced, so that the expenses of working forthwith would be considerably lessened, tributers filling up several of the places instead of tutwork men, and the stamps at present being worked by water.—S. J. REED.

The CHAIRMAN suggested that the additional month's cost should be divided into three items, and spread over the twelve months.—Mr. CHAPMAN suggested that as the cost had been incurred it should be included in the present statement.

After some discussion it was decided to include the additional month's cost, by which the debit balance was increased to 1828*l.* 13*s.* 11*d.*—that is, charging five months' cost against four months' returns.

Capt. REED (the manager), in reply to questions, stated that during the 16 weeks embraced in the accounts 13 tons of tin were sold, realising 656*l.* Had it not been for the floods, by which all Cornish mines had been more or less affected, the returns would have been greater, as by the influx of water they had been unable to work the most productive parts of the mine. That difficulty, he was glad to say, had now been remedied, and he proposed to work at least for a time upon tribute instead of tutwork. There were two lands that could continue to drive on tribute. The next sale of tin would realise 150*l.*

The CHAIRMAN said it was satisfactory to find that although the mine was being opened out for the future the returns had increased as compared with a few months since.—Mr. MIDGELEY said that the more tin they returned the larger were the calls.

Mr. SHARP said that was partly owing to the fact that some shareholders had relinquished their interest, but besides this there were more men employed in opening out the mine.

Capt. REED, in reply to questions, stated that the underlie of the lode had been very regular until within the last few fathoms, when it had been less, or about 2 ft. per fathom as against 3 ft. He thought the most unproductive parts could be advantageously suspended, at any rate, for a time. Looking at matters as they at present stood, that, he thought, would be the most feasible thing to do, until a better price could be made of tin.

Mr. CHAPMAN said if they wished to work the mine properly, it should be worked without regard to present returns.

Mr. SIMPSON was a considerable shareholder, and, as far as he could see, there did not seem a very cheerful prospect before them—there did not even seem the chance of the mine paying its own way.

Capt. REED said they had the chance of making fresh discoveries, which would be an addition to the returns already making. Mining was an uncertainty, but in this case the prospects were most encouraging. Within four months there were good chances of making discoveries, as the lode would have been reached at two points; and if it proved of only the same character as hitherto, the mine would at once be self-supporting.

Mr. SIMPSON asked if Capt. Reed thought the mine would pay its own way in 12 months?

Capt. REED said that within that time important points would have been reached, and the chances were greatly in favour of finding that a productive mine.

Mr. SIMPSON said the non-fulfilment of promises held out had made him more anxious about the mine than the fact that it was necessary to make calls.

Capt. REED said that had arisen from the flooding of the mine; for two months they did not sell more than 2 tons. Had it not been for this the returns would have been kept up and maintained.

Mr. STEVENS thought it would be advisable to have the mine inspected by some independent agent.

Mr. SHARP read a report by Capt. Prisk, who had inspected the mine on behalf of a shareholder. The report stated that the mine during the present year should be self-supporting.

Capt. REED, in reply to a question, stated that it would cost 12*l.* per fathom to sink the flat-rod shaft, and it would be sunk at the rate of 2 fathoms per month.

The accounts were passed and allowed, and (with the report) were ordered to be entered on the minutes. A call of 10*s.* per share was made.

Mr. SIMPSON suggested that an independent agent should be sent to inspect and report on the mine.

The CHAIRMAN said that an independent agent should be employed to make an exhaustive examination of the property and report thereon, and that a meeting should be called to consider it.—A resolution to that effect was passed.

A vote of thanks to the Chairman closed the proceedings.

KIRK MICHAEL MINING COMPANY.

An extraordinary general meeting of shareholders was held at Ramsey, Isle of Man, on Feb. 18,

Mr. ORLANDO WEBB in the chair.

Owing to a certain number of shareholders (the vendor and friends) declining to enter the room to form a quorum until one hour had elapsed from the time fixed the proceedings were rendered informal. The object of the meeting was to wind-up the company, apparently with a view to reconstitution.

The CHAIRMAN explained the financial condition of the concern, and the dealings with the vendor. The mine had not proved so satisfactory as anticipated, and the time had arrived for considering whether the company should be wound-up. A letter he had received from Mr. Ridgway, of London, a large shareholder, stated that "personally he had no faith whatever in the success of the concern, and heartily desired to be quit of it." The company was now in this condition. All the money raised (18*s.* per share) had been expended, and he (the Chairman) and Mr. Chalmers had during the last three months advanced 227*l.* 6*s.* 9*d.*, or the men would not have been paid. The company is 457*l.* in debt., and has accruing liabilities for rents, &c., whilst the assets, consisting principally of 31 tons of ore, and arrears of call amount to 436*l.*, leaving 21*l.* debit balance. He stated that those who had inspected the mine agreed that there was a good paying lode in the mine, but their funds were too small to enable them to get at it. He was told that Mr. Charles Tetley had expressed a strong opinion to the effect that he knows where a very large quantity of lead—5000*l.* worth or 5000 tons—was to be met with in the mine, but he had not told the directors; yet when they remembered that Mr. Tetley received from the company no less than one-third of the

entire capital in free shares, he thought they would agree with him that Mr. Tetley was bound to render the directors every assistance he could in developing the resources of the mine. He, therefore, asked Mr. Tetley, before the meeting, whether it was true that he had made any such statement?

Mr. C. TETLEY complained that he had not been permitted to put in his own friends as directors. He complained that proper efforts had not been made to find the lode lost on the right hand side of the adit. He said he had found out that the east and west lode which he had discovered had been walled up. Why, he would like to know, was this not being worked now? He admitted that he had stated that he could get 500*l.* worth of ore in two months if the mine were placed in his hands. He read the 221st clause of the Manx Criminal Code, which makes the publication of false statements by companies' officers a misdemeanor.

The CHAIRMAN enquired the date of the Criminal Code.——Mr. C. TETLEY said it was 1872.——The CHAIRMAN only regretted that it was not in force at the time the prospectus was issued.——Mr. C. TETLEY said that was a new question which could be raised at another time, but at present he was speaking of the correctness of the report of the previous annual meeting supplied to the shareholders. He and his friends wanted a majority on the board; they had been offered two seats out of five, but this he declined.

A SHAREHOLDER asked Mr. C. Tetley whether he could not work in harmony with Capt. Woolcock for two months until they got this 5000*l.* worth of lead?——Mr. C. TETLEY: Impossible.——Mr. CONNELL remarked that Capt. Woolcock was blamed because he had not found the lead, when the fact might be that it was not there to find.——Mr. C. TETLEY expected that if they drove under the hill a rich lode would be found there.

The CHAIRMAN said he had already expressed his regret that he had rejected the proxies [stamped proxies are not required in the Isle of Man], but remarked that it did not affect the election of directors, as Mr. Pritchard and Mr. Tetley, who had been proposed, had both withdrawn before the question of proxies arose. However, what they now wanted was to get at the 5000*l.* worth of lead.

Capt. WOOLCOCK explained the various work that had been done, and said that every step taken had not been at his suggestion, but some had been on the advice of the mining captains who had from time to time inspected the mine. As to the walling up of the lode, all that had been walled up was the great dowk vein, and that was done to keep it from falling in.

Mr. JACKSON denied having written the prospectus, and said it had been written or approved by Mr. Tetley; and a personal dispute having arisen between Mr. Tetley and Capt. Woolcock, Mrs. CUBBON, the woman who minds the office, was called in as arbitrator. She said that upon a certain day Capt. Woolcock did call her upstairs to see the state the office was in, the drawers opened, and papers screwed about, but he did not tell her that it had been done by Mr. Tetley, as Mr. Tetley had supposed. When Mrs. Cubbon had been induced to withdraw, and the excitement had somewhat subsided,

The CHAIRMAN said that it had really been a matter of disappointment to the directors that they had not been able to secure from the mine some return for the shareholders. They were willing to work with Mr. C. Tetley, and in accordance with his views, as far as possible. They would endeavour, to a reasonable extent, to find the body of ore he referred to; but he (the Chairman) would not be disposed to spend a very large amount in the prosecution of this search.

Mr. TETLEY urged the discharge of Capt. Woolcock, because he had found nothing; but it was remarked that those who had inspected the mine had reported that Capt. Woolcock had properly carried on the work; and that Capt. Woolcock had been most cruelly treated by Mr. Tetley, who had actually laid a criminal information against him, and now finding that he had made a mistake, had left Mr. Woolcock to pay the expenses.

At a directors' meeting afterwards a call of 1*s.* per share was made, payable on March 23.

WEST TOLGUS MINING COMPANY.

The two-monthly meeting of adventurers was held at the mine, on Tuesday, Mr. RICHARD TAYLOR presiding.

The mine is looking exceeding well, one point being worth for copper 100*l.* per fathom, another point is worth 80*l.* per fathom, and two stopes are worth 90*l.* per fathom. A profit of 826*l.* was shown on the two months' working, a dividend of 25*s.* per share declared, and a credit balance of 440*l.* carried forward, after charging 150*l.* on account of the thirteenth month. The accounts presented were—Labour costs, two months ending Jan. 28, 1745*l.*; merchants' bills, 1386*l.*; charged on account of thirteenth month, 150*l.*; total costs, 3278*l.* Credits: By copper ore sold, 577 tons, less 1-40th lords' dues, 4102*l.* Profit on the two months' working, 826*l.*, which, added to credit balance from last account (254*l.*), made a total credit balance of 1080*l.*

The CHAIRMAN said that the erection of a whim engine had been recommended, and if this were decided on he thought that the balance in hand might be appropriated for that purpose. Another and greater expense to be contemplated on some future occasion was the erection of another pumping-engine, to assist in getting rid of the enormous body of water with which they had to contend; and, in order to pump the mine effectively, he thought they would also require a new perpendicular shaft, but it was premature to talk of this at present.——West Tolgus is one of those mines which it was thought twelve months ago would be abandoned, but the shareholders now seem likely to be recouped for their former outlay. The costs are charged up to the end of January, and the copper ore already sold for the next account has realised 4216*l.*

NORTH POOL MINING COMPANY.

An extraordinary general meeting was held at the offices, Great St. Helen's, on Thursday,—Dr. J. G. K. BURT in the chair.

Mr. E. J. BARTLETT (the secretary) read the notice convening the meeting.

The CHAIRMAN: I am sorry to notice such a poor attendance to-day, as I expected many of our proprietors would have made it convenient to come. As we found that sufficient subscriptions for the proper working of the mine did not arrive from the issue of shares the directors resolved at a recent meeting to recommend that debentures for 5000*l.* be created, and of this sum 2500*l.* be issued forthwith. A report has been received this morning from our manager, which must be considered most favourable, and the shareholders have it in their power either to cripple the hands of the directors, or by their subscriptions find the means of development. I will move that the resolution of which you have had notice be adopted.

Mr. W. ARTHUR, in seconding the resolution, said he thought that subscriptions would result if debentures for a lower sum were issued.

The CHAIRMAN: I shall have much pleasure in meeting the wishes of my co-proprietors, and the secretary will, in sending out his notices, call attention to the alteration.

After a long conversation upon the important position of the mine, the proceedings terminated with a vote of thanks to the Chairman and secretary.

THE PHOSPHOR BRONZE COMPANY.

The first annual general meeting of shareholders was held at the company's offices, Cannon-street, on Thursday,

Mr. JAMES ROCK in the chair.

Mr. R. PAYNE (the secretary) read the notice convening the meeting, and the report of the directors, with balance-sheet and revenue accounts, were submitted:—

With the object of making the annual accounts to close with each year in future, the directors have balanced the books up to Dec. 31 last, thus showing the results of nine months' trading only. Notwithstanding stagnation and extreme depression during this period in the metal trades, more especially in ironworks, from which a considerable demand for phosphor bronze, in the shape of tuyeres for blast-furnaces and bearings for rolling mills, was expected, a profit is shown which is, all things considered, very encouraging. Neither the capital at command of the company nor the general aspect of trade have justified the directors in doing more than to carry on the foundry which they took over from the Pioneer Company, and to use the best means in their power, by establishing agencies in various parts of the United Kingdom and abroad, and by disseminating information regarding the properties and advantages of phosphor bronze. They have taken no steps toward establishing rolling mills, nor do they intend to do so at present. They have had wire and tubes drawn, and have executed some small orders in that branch of business, which they hope may ultimately become one of the chief sources of revenue. The profit on the foundry has been considerable for the small amount of capital actually employed in it. The capital subscribed has not been more than sufficient to carry on the business in a limited manner, and to pay a small portion of the price of purchase agreed upon with the liquidators of the original company. They are now making arrangements which they hope, when completed, will be satisfactory to all parties, for deferring the payment of a considerable portion of the purchase-money, the same bearing interest at the rate of 5 per cent. per annum until paid off, and they anticipate that it will also be arranged for the fully-paid shares, which constitute a part of the price at which the business was purchased, to be deferred until the active capital shall have received substantial dividends. The directors propose to issue 5000*l.* fully-paid shares to provide for 4800*l.* instalments payable to liquidator before May 10; and with the further view of strengthening the company in carrying on its business, they also offer another 5000*l.* in ordinary shares, upon which they propose to call up only 1*l.* per share for the present. In this early stage of the company's working your directors do not wish to burden the undertaking with more charges than are absolutely necessary; they have, therefore, taken no remuneration for their services, but at the same time reserve to themselves this right when larger profits are made, and the company can better afford it. The amount of profits to be disposed of would pay a dividend of about 20 per cent. upon the paid-up capital, but as these profits have been partly earned by the property of the original company, not yet paid for, your directors think it right to recommend a dividend at the rate of only 10 per cent. per annum upon the paid-up capital, the surplus being carried forward to the next half-year's account.

The CHAIRMAN said that, although the meeting was so small, it might be well for him to say a few words. In the beginning of the report it was said that the accounts referred to only nine months' working, and it should be explained that the present company was only registered on May 20 last, which was but seven months ago, but the business of the Pioneer Company was taken over as from April 4. The company, although not doing so much as its most sanguine members might desire, was doing a fairly satisfactory business. They had not sought for capital in the usual manner, but it had been subscribed privately, and as further capital became necessary they hoped they should be able to obtain it in the same way. They had not advertised the company, but their metal, and they hoped by quiet and steady working to make the company a great success. After referring to the other matters mentioned in the report, he remarked that their order book would show that a very large number of customers had given them repeated and increased orders. The Pelsdon Iron and Steel Company had been good customers, and the London and North-Western Railway, when putting up their new mill at Crewe, had ordered 162 bearings. Messrs. Powis, James, and Co. had found phosphor bronze very suitable for their machinery, which they run at a very high speed. From the Royal Arsenal they had an order for 3 tons, and at the Royal Gunpowder Works, at Waltham Abbey, phosphor bronze had been used as a substitute for steel and copper, and recently rollers of the metal were supplied to be used in the manufacture of gunpowder. Chubb and Sons had a standing order for keys of phosphor bronze, and many other large safe manufacturers were sending orders for them. Messrs. McKean and Co. had long used the metal for their rock-drills; and lately Mr. Darlington had adopted it. Messrs. Brotherhood and Hardingham attribute the the success of their 3-cylinder engine to its use. This engine runs at an extremely high speed, and finding that for their crank-pin nothing they had tried would stand, even ⅛ inch of the best steelbeing cut through in half an hour; phosphor bronze was tried, and after running three months showed no wear. Large profits could not be expected in so short a time, especially as they were introducing a high-priced article; but the prospects for the year were very encouraging, as January had been the best month they had had, and February promised to surpass it. There was now a greater inclination to take phosphor bronze in ingots, the manufacturer making his own castings; this would give the company a larger trade than castings from patterns, and the returns would be quicker.

Mr. DICK (the managing director) stated, in reply to an enquiry, that phosphor bronze wire had been sold only in small quantities, principally for experimental purposes, the results of the trials having been satisfactory.

Capt. Sir EDMUND COMMERELL remarked, with reference to the accounts, that everything had been charged to revenue which could with any reason be charged to revenue account.

The CHAIRMAN said he ought to have mentioned that the Government were now specifying phosphor bronze for certain parts of their marine engines, and that many of the principal railway companies had given large orders for bearings and other castings; and that, consequently, renewed and increased orders might confidently be looked forward to during the present year.

The resolution for the reception and adoption of the report and accounts having been proposed and seconded, were unanimously carried, and thanks having been voted to the Chairman and directors the proceedings terminated.

BASYE CONSOLIDATED SILVER MINING COMPANY.

A general meeting of shareholders was held at the Cannon-street Hotel, yesterday (Friday).

Mr. T. W. LEE (secretary) read the notice convening the meeting.

The report of the directors stated that, in accordance with a resolution passed at the last meeting, they had endeavoured to effect the sale of the company's mill and property for the sum of 20,000*l.* in shares, to a company then about to be formed with a capital of 100,000*l.*; these negociations fell through, in consequence of the company having failed to be carried out. The directors have now the pleasure to inform the shareholders that on Aug. 17, 1874, they were successful in making a far more advantageous arrangement, and sold the mill, ranche, &c., for the sum of 15,000*l.*, in shares, to the British Mining and Milling Company (Limited), the capital of which is only 50,000*l.* The latter company is possessed of some valuable mines, contains milling ores, within an easy distance of the mill. The mill was worked for a short time during September and October, 1874, and the results then obtained fully justify the directors in thinking that the bargain they have made is a good one. At the present time the mill is not working, but it is intended to commence in April next, when there is every prospect of a successful and continual run throughout the summer.

The directors regret to inform the shareholders that the mines belonging to the Basye Company (Limited) have resulted in a great disappointment, and are in their present state scarcely worth working; of course, there is a possibility of their improving by sinking upon them to a considerable depth, but if the directors are to continue the sinking and working on the property, it will be necessary for the shareholders to find them further capital.

MARBELLA IRON ORE COMPANY.

The report to be presented at the meeting of shareholders states—

The profit for the year amounts to 13,090*l.* 12*s.* 7*d.*, out of which the directors propose that a dividend of 5 per cent. per annum, free of income tax, should be paid on and after Friday, March 12. This will absorb 12,500*l.*, and leave a balance of 590*l.* 12*s.* 7*d.* to carry forward to the credit of the current year's profit and loss account. The result, owing to the continued depression in the iron trade, has not fully realised the expectations of the directors, but is still such as under the circumstances will they trust meet the approval of the shareholders. The output for the year has amounted to 55,339 tons, showing an increase as compared with 1873 of 15,840 tons. The directors expect this year's output will show a still greater increase.

The Darlington drills have not as yet materially affected the output, but have been of considerable service in developing the galleries, and the directors expect henceforth from these operations a considerable additional output of ore of rich quality. The quality of the ore is highly satisfactory, and the percentage of metallic iron increases as the mining operations deepen. The railway and plant have been maintained in good working order.

The shareholders are already aware that the pier at Marbella was seriously damaged in October last by the screw steamer M. Moxham. This will involve a partial reconstruction of the pier, and meantime subjects the company to inconvenience and expense in loading. The directors, however, have been advised by eminent counsel that there is no doubt that the owners of the steamer are responsible not only for the expense of repairing the pier but for all consequential damages legitimately arising from the accident; and, therefore, no reserve from profits has been thought necessary. They have instituted legal proceedings to enforce this liability in the Court of Admiralty.

ALDERLEY EDGE MINING COMPANY.—At a general meeting of shareholders, held at the mine, on Jan. 27, a further dividend of 5*s.* per share was declared, making the total amount of dividend 12*l.* 6*s.* 8*d.* per share.

GUNNISLAKE.—At a meeting on Monday the accounts for the four months ending Jan. 9 showed a credit balance of 152*l.* 1*s.* 2*d.*, and a profit on the four months' working of 62*l.* 15*s.* 3*d.* A dividend of 61*l.* 7*s.* 6*d.* (1*s.* 3*d.* per share) was declared. Capts. W. Skewis and John C. Seccombe reported upon the various points of operation. Looking at the mine generally, they consider the prospects are very encouraging.

UNITY WOOD.—At the meeting, on Feb. 18, the accounts showed a loss on the three months ending December of 97*l.* 19*s.* 1*d.*, and a debit balance to Dec. 31 of 121*l.* 4*s.* 9*d.* A call of 2*s.* 6*d.* per share was made. Capts. G. E. Tremayne and W. Mayne reported upon the various points of operation. At Reed's shaft, which is about 200 fms. north-west of the engine shaft, and on the course of Williams's copper and tin lode, they have sunk a winze in the botom of the 20, about 15 fms. west of shaft, which is down 9 fms.; the lode throughout the whole of this depth has been 4 ft. wide, and worth at places from 30*l.* to 40*l.* per fathom for tin. At present in the bottom of the winze the lode is 6 ft. wide, and worth 40*l.* per fathom for tin, with great promise for further improvement. The winze is being sunk quite in whole ground, nothing having been done on the lode in this part of the mine below this level. The shaft is now sunk below the 20, and they propose sinking it to the 30, and drive to communicate with the winze, the completion of which they have every confidence will lay open a most valuable piece of rich tin ground. In consequence of not being able to burn the tin whits they have on the mine the returns for this meeting had not been so much as calculated; they are still busy burning, and will soon have another parcel of tin ready for sale. During the past week the water in the mine has considerably decreased, and they hope that the wet season is over, so as to enable them to prosecute the bottom of the mine with vigour. They are at present engaged preparing the work for fixing a new boiler, and when this is completed they will at once repair and put the other boiler in good working order.

VAN RAILWAY.—The half-yearly meeting of this company was held on Wednesday, at the Van Mine, near Llanidloes, the chair being occupied by Mr. A. R. Boughton Knight, the Vice-Chairman of the Company. The directors' report and accounts, which had been before circulated, were taken as read. The Chairman, in moving the adoption of the same, briefly referred to the affairs of the company, and said that the same were in a satisfactory condition. The returns for the half-year ending December 31 had amounted to 1027*l.* 3*s.* 1*d.*, an excess of 216*l.* 6*s.* 6*d.* over the corresponding period of last year. The expenditure had in the same period increased only 110*l.* 18*s.* 2*d.* The profit realised admitted of a dividend at the rate of 4 per cent. per annum for the half-year. The accounts having been formally adopted, the resolution declaring the dividend was carried, and the shareholders separated with a cordial vote of thanks to the Chairman and directors.

'For remainder of Meetings see to-day's Journal.]

PROSPECTORS' COMPANION FOR NEW SOUTH WALES.—A useful little volume has just been issued through Messrs. Trübner and Co., of Ludgate Hill, under the title of "Basch and Co.'s Mineral Guide and Prospectors' Companion," which, although professedly a compilation, has evidently had considerable care bestowed upon its preparation. The compiler has availed himself of the writings of the earliest explorers, has consulted the most eminent works extant, and has noticed the discoveries of the late Prof. Thompson, showing the exact localities where gold, silver, tin, copper, &c., are to be found. The geological formation of all the known auriferous and metalliferous spots is given, so as to enable the prospector to tell at once if he be in a locality likely to contain the mineral he is seeking for. The chapter on the nature of the deposits of the metals and their ores, chiefly from Whitney's "Mineral Wealth," is a very interesting one, whilst that on the principles of the blowpipe is concise and explicit. The retention of the American orthography appears peculiar, but, of course, detracts nothing from the value of the book, and as the source of the information is chiefly American, the frequent reference to American works is equally admissible. Mining operations are described as of two kinds, the object being in one case to extract the contents of clefts and fissures that have been made in strata, and have afterwards become partly or entirely filled by valuable metallic substances distributed through them, while, on the other hand, it is intended to take away the whole or the greater portion of actual layers or strata, the former being necessarily more speculative than the latter. The value of the second portion of the book indicating the geological formation of the several localities, arranged so that it can be referred to with the greatest facility, can scarcely be over-estimated. Not only should every prospector possess himself of the volume, but everyone engaged in connection with the mineral industries of the colony.

ROCK-DRILLS.—Mr. HASELTINE has patented (for E. S. Winchester, of Boston) some improvements in rock-drilling machines, parts of which invention are applicable to other machinery. This invention consists, first, in placing the packing within a groove extending around the interior of the cylinder: also in securing the sections of the cylinder together by bolts or otherwise, and in forming shoulders at the ends of the sections; also in a channel or channels extending from each end of the sectional cylinder to the packing; also in a novel construction and arrangement of the valve and ports of a rock-drill engine; also in a piston having a long bearing surface; also in providing the valve of a rock-drill engine with an elastic or spring arm; also in placing the action of the drill at all times under the complete control of the operator in a more simple and effective manner than heretofore; also in providing elastic buffers outside the cylinder, and also in interposing an elastic washer or spring between a projection or shoulder on the feed-screw and the plate by which its rear end is supported.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

DUBBY SYKE MINING COMPANY (Limited).—Capital 10,000*l.*, in 1*l.* shares. To carry out an agreement made between Thomas Ridley on behalf of the company, and J. H. Robinson, of Newcastle-upon-Tyne, for the acquisition, for the sum of 4500*l.*, of a parcel of ground, situate at Upper Teesdale, Durham. The company will also carry on business as smelters and brick and tile manufacturers. The subscribers are—J. H. Robinson, Newcastle-upon-Tyne, architect, 350; R. Wight, Killingworth, Northumberland, colliery engineer, 250; J. Snowball, Gateshead, coal owner, 300; T. Sheldon, Jarrow, Durham, chemical manufacturer, 200; G. H. Snowball, Gateshead, fire-brick manufacturer, 200; J. Monks, Aiden Cottage, Durham, merchant, 500; and J. C. Suam, Newcastle, chemical manufacturer, 300. Messrs. J. C. Suam, J. Monks, J. Snowball, R. Wight, and J. H. Robinson will be the first directors, the qualification being 100 shares. The office of the company is at 25, Westgate-road, Newcastle.

FINLAND CHARCOAL IRONWORKS COMPANY (Limited).—Capital 30,000*l.*, in 10*l.* shares. To purchase certain lands in the province of Uleaborg, Finland, consisting of 3683 acres, together with other lands covered with water commonly called the Ore Lakes, also the buildings, furnaces, &c., the property a company having the same title as the present company, registered June 20, 1872. An agreement has been entered into for the above purpose between James Fraser, the liquidator of the old company, and Sir T. G. Browne, G. H. Gauntlett, Esq., and Alexander Brogden, Esq., M.P., on behalf of the new company. The three last-named gentlemen will be directors, at a remuneration of 500*l.* per annum. The subscribers (who take one share each) are—Sir T. G. Browne, Harrow, chief clerk, Charity Commissioners; G. H. Gauntlett, Harrow; J. Coates, 24, Gresham-street, stockbroker; E. F. Coates, 24, Gresham-street; J. Fraser, 169, Camden-road, accountant; P. McLagan, M.P., Belgrave Mansions; and Alexander Brogden, M.P., 51, Princess Gate, Hyde Park. The offices of the company will be at 7, Bank Buildings, Lothbury.

CORPORATION PROPERTY COMPANY (Limited).—Capital 250,000*l.*, in 10*l.* shares. To acquire a property known as the Victoria Plot, situate near Victoria-street, Manchester. The subscribers are—A. Hamilton, 100, King-street, Manchester, 500; J. Allen, 26, Victoria-street, Manchester, 500; J. H. Workington, Church-street, Manchester, 200; J. Longson, Fern Bank, Stretford, 500; W. Cottrell, Pendleton, 500; T. H. Jenkins, 1, York-street, Manchester, 300; J. Gill, 3, Church-street, Manchester, 400.

IMPERIAL PROPERTY INVESTMENT COMPANY (Limited).—Capital 100,000*l.*, in 10,000 shares of 1*l.*, and 9000 of 10*l.* each. To acquire landed property for building and other purposes. The subscribers are—Andrew Wark, Bartholomew House, 2500; R. T. Turnbull, 5, East India Avenue, 1250; L. Stewart, 10, St. Mary Axe, 1000; T. D. Thomson, 75, Cornhill, 2750; D. Blythe, 40, Hildrup-road, N., 750; J. Turnbull, Walmer-crescent, Glasgow, 1250; R. M. Dingwall, Boston, 500.

LANE ENDS ESTATE COMPANY (Limited).—Capital 100,000*l.*, in 10*l.* shares. To acquire the Lane Ends Hotel and other property at Blackpool. The subscribers are—W. H. Cocker, Blackpool, 1000; J. Fletcher, Lytham, 100; J. J. Smith, Market Place, Preston, 100; J. B. Hallmas, Market Place, Preston, 100; J. Dewhurst, Church-street, Preston, 50; J. H. Booth, Fishergate, Preston, 100; A. W. Viener, Blackpool, 50.

BELGIAN THERMO-ELECTRIC GENERATOR COMPANY (Limited).—Capital 50,000*l.*, in 5*l.* shares. To acquire letters patent granted to Mr. C. Glamond by the Belgian Government for improvements in the construction of thermo-electric generators. The subscribers are—A. Langdale, York Gate, Regent's Park, 20; T. C. Sharp, 57, Grace-church-street, 20; J. Tanner, 6, East India Avenue, 20; E. A. Vernard, Mayers-road, Forest Hill, 20; T. F. Henley, St. George's-square, 20; W. S. Emden, 8, Fitzroy-street, 24; H. B. Worrell, Arcaster-terrace, Peckham, 5.

ADELPHI MUSIC HALL AND ENTERTAINMENT COMPANY (Limited).—Capital 5000*l.*, in 1*l.* shares. This is an Oldham company,

JOHN BARKER AND SONS (Limited).—Capital 10,000*l.* in 5*l.* shares. To acquire an engineer's business at Oldham.

BOURNEMOUTH PROMENADE PIER COMPANY (Limited).—Capital 15,000*l.*, in 10*l.* shares.

LONDON EGG AND POULTRY SUPPLY ASSOCIATION (Limited).—Capital 20,000*l.*, in 5000 preference shares of 2*l.*, and 200 deferred shares of 50*l.* To supply eggs, poultry, &c. The subscribers (who take one share each) are—G. A. Browne, 12, Budge-row; W. N. Thompson, 95, Neville-road, N.; W. H. Gibson, Wilson-terrace, Canonbury; H. Day, 47, Bloomsbury-square; G. W. Harman, Ryde Vale, Balham; H. Beckwith, 14, Great Winchester-street; and W. Wilkinson, Witham Villas, Balham.

BLACKTHORN COTTON SPINNING AND MANUFACTURING COMPANY (Limited).—Capital 20,000*l.*, in 5*l.* shares. To carry on cotton spinning at Bacup.

FOLKESTONE PROMENADE PIER COMPANY (Limited).—Capital 10,000*l.*, in 10*l.* shares.

NORTHERN BOHEMIAN COLLIERIES COMPANY (Limited).—Capital 100,000*l.*, in 600 100*l.* preference shares, and 4000 10*l.* ordinary shares. To carry into effect an agreement made between G. C. V. Holmes, of Norwood, and H. Stephens Lambert, of Gresham House, for the carrying on and development of certain collieries, the precise locality of which is not given. The subscribers (who take one ordinary share each) are—Francis L. Barrington, St. James-street, gentleman; H. S. Lambert, 182, Gresham House, secretary; D. A. L. Farquar, Murisk House, Aberdeenshire, gentleman; C. J. Sharp, 22, Walbrook, contractor; H. M. Randall Pope, 4, Stone Buildings, Lincoln's Inn, barrister; H. Smith, 1, Porter-terrace, Brook Green, articled clerk; S. B. Bennett, Bloomfield Villas, Shepherd's Bush, articled clerk. The remuneration of directors is to be at the rate of 700 guineas per annum as soon as a dividend at the rate of 5 per cent. has been earned on the preference shares, and at the rate of 1400 guineas as soon as a dividend of 10 per cent. has been earned on the whole capital. The qualification for director is 200 ordinary, or 10 preference shares. Mr. G. C. V. Holmes will be the manager, and Mr. Lambert the secretary of the company.

ROBERT BESWICK AND COMPANY (Limited).—Capital 100,000*l.*, in 10*l.* shares. To acquire the estate and title of Robert Beswick in certain coal, ironstone, fire-clay, &c., known as Chell Collieries, in the parish of Wolstanton, Stafford. The subscribers (who take one share each) are—A. Douglas, 19, Gloucester-terrace, Hyde Park, civil engineer; E. Levy, 2, Gresham Buildings, agent for elections; W. Marshall, 81, Talbot-road, Bayswater, brewer and malster; R. Carr, 175, Laurence-road, Notting Hill; Luke Bishop, 10, Queens-place, accountant; J. S. Betts, Eastcott, accountant; and H. Robinson, Great St. Andrews-street, Bloomsbury, tailor. The directors will be Messrs. L. Bishop, R. Beswick, jun., R. Carr, and A. Douglas, their remuneration being 1000*l.* per annum, and the qualification being the holding of 1000*l.* shares in the company. Mr. R. Beswick, jun., will be the manager, and Mr. J. S. Betts the secretary.

BLACKPOOL SKATING RINK COMPANY (Limited).—Capital 3000*l.* in 25*l.* shares.

BOROUGH OF WENLOCK CONSERVATIVE NEWSPAPER COMPANY (Limited).—Capital 1000*l.*, in 1*l.* shares.

BORING MACHINERY.—Mr. W. TREGAY, of Redruth, has patented some improvements in machinery for drilling or boring rocks and other hard substances. The invention consists mainly in the employment of a bore rod having a plain exterior without an end to end screw, which can be rapidly run in and out by hand without any complicated machinery, and changed or lengthened as the boring progresses by screwing on additional pieces at the rear end. It also relates to the general arrangement of the machinery.

EPPS'S COCOA—GRATEFUL AND COMFORTING.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Civil Service Gazette.*

FOREIGN MINING AND METALLURGY.

The strike in South Wales, which has had some influence upon the tone of the Cleveland iron trade, begins also to make its effects felt in Belgium, and it may possibly bring to Belgium a few orders at remunerative prices. The Regissa works are stated to have obtained from M. Syllié-Pauwels an order for 1000 tons of iron from one of the habitual clients of an important establishment in South Wales. Girders, and even merchant iron, are also being made in Belgium for the English market. On the other hand, Belgian industrials see intelligently enough that it will not do for them to place too much reliance upon a sustained current of English orders, as the present difficulties between masters and men in Wales are certain to have the eventual effect of reducing the cost of production in the principal English centres. The German Government has just given the Angleur Steelworks an order for one-third of the steel rails for which the management recently tendered at low rates at Strasburg, distancing on the occasion all German competitors. In August, 1874, some German steel rail manufacturers tendered at lower rates than their Belgian opponents for steel rails for the Belgian State Railways, but they were only permitted to supply 3000 tons out of 7000 tons. In giving an order to the Angleur Works for only a portion of the steel rails, for which they tendered successfully, the German Government is supposed to have acted on the principle of tit for tat. There is certainly not much love lost between Belgian and German industrials.

Copper has been somewhat feeble at Paris. Chilian in bars, delivered at Havre, has made 87*l.* 12s. per ton; ditto ordinary descriptions, 85*l.* 12s.; ditto in ingots, 90*l.*; and English tough cake, 90*l.* per ton. Copper has been a little better supported upon the Marseilles market. Tin has been tending downwards upon the Paris market; Banca, delivered at Havre or Paris, has made 100*l.*; Straits, 95*l.*; and English, delivered at Havre or Rouen, 96*l.* per ton. Tin has continued weak at Rotterdam. Several transactions have taken place in Banca at 54 fls. to 54¼ fls.; Billiton has been dealt in at 52¼ fls., and with delivery in May at 52 fls. to 52¼ fls. Lead has been quoted at 22*l.* 12s. at Paris, without regard to the source of supply or the place of delivery. Silesian zinc, delivered at Havre, has made 25*l.* 4s. per ton at Paris; other good marks, delivered at Havre, has made 24*l.* 16s.; and ditto, delivered at Paris, 25*l.* per ton. There have been few variations in zinc at Marseilles; rolled Vieille-Montagne has brought 32*l.* per ton, while zinc from other sources has realised 31*l.* 4s. per ton.

A fall in prices is now an established admitted fact in the French coal trade, so that a regime of secret concessions and fictitious prices which has long prevailed may be regarded as terminated. Coal is gradually declining in price in France—of that there is no doubt, and the reduction in quotations will enable the iron trade to emerge from the lethargy in which it has long languished. Mining and metallurgical industry are so intimately associated with each other that when the first is sick the second suffers also; a certain equilibrium must prevail, or everything goes wrong. The present tendency of things appears to be to re-establish this equilibrium, which was broken some time since. The downward tendency in prices will, probably, involve the question of a reduction in wages. The Anzin Company is now delivering engine fuel at 13s. 8d. per ton at the works. At Paris the best household qualities are selling at *l.* 5s. per ton delivered.

February has nearly gone, and it leaves the French iron trade in a precarious condition. A revival is anticipated in business from day to day, but the hope continues to be disappointed. The aspect of French politics is still characterised by instability, and this circumstance continues to exert a disastrous influence upon industry generally, and upon the iron trade in particular. Contracts of any serious importance do not present themselves; matters just drift on from day to day. Consumption is being restricted on all sides, and furnaces are being extinguished. The fall in the price of coal will eventually produce, it may be hoped, some improvement in the situation. Prices of pig and iron generally remain unchanged.

The organs of the Belgian coal trade take a more and more sober view of the situation. It is true that they talk about a serious revival in affairs next month, but it is difficult to discern any real grounds for this reasoning. The Belgian iron trade gives no sign of increased life, a blast-furnace and two ironworks having, on the contrary, been blown out this week. The sugar manufacturing interest, after a not very profitable season, is in no haste to renew its contracts for the future; as regards domestic qualities, the winter is drawing to a close, and stocks exhibit some tendency to increase. The best proof of the inactivity which characterises transactions is to be found in the low selling prices current; buyers everywhere exhibit hesitation, and this state of things can only terminate when the iron trade again appears upon the market for the purpose of laying in supplies upon a large scale. A reduction in wages is being effected little by little in many of the collieries of the Hainaut, without any very great opposition on the part of the men, who appear to appreciate the difficulties of the situation. The reduction which has thus commenced in wages appears likely to extend into all the Belgian basins.

GOLD QUARTZ MINING—THE SIERRA BUTTES COMPANY.

Having now obtained a fair idea of hydraulic gold mining, I determined to start for Sierra Buttes, which may be taken as a representative mine of the gold quartz section; it is owned by an English company, and is, from the extent of its workings, the energy with which it is carried out, and the particularly steady and reliable quality of its rock, very highly thought of in California. Far up on the hill side, 1500 ft. above the village of Sierra City, lie the mine and works of Sierra Buttes. The mine is named from a splendid range of crags which rise a mile or two behind it; the word Buttes is pronounced soft, as if it were spelt butes. The road up to the mine is three miles in length, while the footpath straight up the hill is only three quarters of a mile; I determined, therefore, to do the journey on foot. The climb was a very steep one, and skirted a small ravine, down which fell the water from the stream which provides water power at the works above; it is not idle now; the bed of the ravine is occupied by a series of some 20 Mexican arrastras, which are worked in succession by its water. In these the tailings are treated, and I will, therefore, defer their description until I have concluded that of the mine.

Sierra Buttes Mine consists of several large quartz lodes, or reefs, or ledges, for they are known in different places under these different names; they are near each other, and there are several cross or counter ledges connecting and crossing them. The principal ledges are known as the North, South, and Main Cliff ledges, the Ariel, the Rose, and the Overhanging ledges. Besides these principal ledges there are a large number of small ones, so that the space enclosed between the inner and outer lodes is a network of quartz veins. It is impossible to enter into any detail concerning the workings of these lodes, which, indeed, are so extensive that it would take a week to inspect them properly. There are at present six levels, and a seventh is commenced. The reserves are large, and the work is fully two years ahead of the stamping capacity, large as that is, for 4500 tons of rock are crushed monthly. The veins are not rich, but they contain everywhere an average amount of free gold, sufficient to pay the expenses of extraction and crushing, and to yield a fair rate of profit. Situated so high up on the hill side the mine is, and for very many years will be, above the water level; there is, therefore, no expense of pumping, an important point here, for the mine is in many places a very wet one. There is no probability whatever that a lode which has held good so far from the surface as this has done will give out, and it may, therefore, be taken as certain that the mine will continue for a generation at least to yield sufficient ore for the stamps now at work. The yield may vary slightly one way or the other, but the whole of the ledges down to the present depth have yielded so even an average that no great change can be looked for either way. The surface works are in some respects very complete, and indeed only need the erection of sufficient pits and buddles to work the whole of the tailings to be quite perfect of their kind. There are 84 heads of stamps, which were all at work when I was there; these are for convenience, and as a protection against fire, divided among three separate buildings, called the Reis, the Hanks, and the Hitchcock mills. Of these the Hanks is the last addition, and does its work the best, securing nearly $9 worth of gold per ton, while the other mills only secure $8 worth. The quartz is first passed through a Blake's stone crusher, which reduces it to a suitable size for the stamps. Inside the stamp-box is placed a sheet of copper, covered with quicksilver, which catches a good deal of the fine gold as it is whirled against it by the action of the stamps upon the water and crushed ore in the box. As the water and ore, crushed finely enough to pass through the fine holes of the screen, trickle out, they run on similarly coated copper plates down long shallow troughs; in these the whole of the free gold is caught by the quicksilver. The tailings now run down on to a long frame; this frame is some 15 ft. long by 1 ft. wide, and is three-sided or prism-shaped; each face is covered with a coarse blanket-like material. As the tailings run over this face the particles composed of sulphurets, being heavier than the rest, are retained in the blankets, while the particles of quartz flow away. At the end of 10 minutes or so an attendant turns the frame one-third round, so that a fresh side is brought uppermost, and then with a hose washes off the sulphurets deposited on the blanket which was last uppermost into a reservoir below. In this way, with a minimum of labour, the greater portion of the sulphurets are separated from the quartz; these sulphurets are subsequently cleaned in a buddle, and are then stored away. At present the company have no appliances for treating these sulphurets scientifically, but oxidise them by exposure to the air, and then work them in pans; the profit from this is about 3000*l.* per annum. They purpose erecting chlorination works shortly, a necessary outlay, as the sulphurets are increasing in some of the ledges as they gain in depth, and contain $200 worth of gold per ton; they will eventually add considerably to the profits of the company. A portion of the tailings receive further treatment in the arrastras placed in the bed of the ravine below the mine. An arrastra is something like a mill used in most brick fields; it consists of a circular bed of stone; from the centre of this rises a shaft with two arms, to which are attached great boulders; the arms extend beyond the circular bed, and are attached to a horizontal wheel with floats or paddles. Against these the water impinges, giving motion to the wheel, and dragging the huge boulders round and round upon the stone bed. In this quicksilver is placed, and the tailings as they run through the mill are ground into the quicksilver by the action of the revolving boulders. There is, of course, a great loss of power in this primitive method of extraction, but where there is a superabundance of waste water power, as at Sierra Buttes, this matters little, and sufficient gold is caught to pay the expenses of labour and of keeping the arrastras in order, and to yield a fair return.

The buildings of the mine are large, numerous, and in good condition. The barracks for the men are comfortable and roomy, and the stores, containing as they did the whole winter supply for the workmen, are quite a sight. The men are boarded as well as lodged, and the food is of excellent quality, abundant, and varied. The miners are for the most part Cornishmen, and are quiet, steady, and well-behaved—a very different set of men from the wild and somewhat lawless population of the Nevada silver mining districts, which I was next to visit. The arrangements for the extinction of fire are excellent, and the mines are connected by a telegraph wire with Sierra City, and thence with the whole country. The Sierra Buttes is one of the best managed and, I believe, one of the most valuable, mines in California.—*Correspondent of the Standard.*

THE INDUSTRIAL PROGRESS OF VICTORIA.

Nothing probably contributes more to increase the prosperity of a country or colony than the diffusion of information demonstrating that the inhabitants have already made satisfactory progress, and that trade and commerce are in a sound condition; it will, therefore, be gratifying to all interested in the welfare of Victoria to learn that the Colonial Government have ordered the publication of the very careful Digest of the Statistics of the Colony for 1873 by Mr. H. H. HAYTER,* which embraces all the particulars which either the intending emigrant or the general trader can desire. Looking over the chapter on finance, it is found that in 1872-3 there was expended through the Commissioner of Railways and Roads 327,608*l.*, and through the Minister of Mines 24,624*l.*, from which engineers and mining officials may estimate their chances of obtaining employment in the colony. There was also a special appropriation of 3500*l.* to the Mining Boards. The expenditure on public works, railway construction, &c., amounted to 1,079,851*l.* in the year. The total population of gold fields at the last census amounted to 270,428, of whom about one-fifth were miners. There were 60 cities, towns, and boroughs, and 110 shires and road districts in existence during 1873. During 1873 articles of the declared value of 16,533,856*l.* were imported into Victoria, and goods valued at 15,302,454*l.* were exported therefrom. The excess of imports over exports was thus 1,231,402*l.*, and the total value of external trade was 31,836,310*l.*

The greater part of the trade of the colony is done, as may be supposed, at the port of Melbourne. In 1873 no less than 14,475,085 letters, 6,089,007 newspapers, and 707,316 packets passed through the post, and money orders to the value of 348,019*l.* were paid. Wages for agricultural labour in Melbourne appears to be about 20 per cent. higher in 1873 than it was in 1863, whilst the cost of agricultural produce is only about the same, and in some cases lower. Artizan's wages (8s. to 10s. per day) and those of general labourers (6s. to 7s. per day) have increased, whilst the cost of provisions remains the same. Mutton costs 2½d. to 5d. per lb.; lamb, 3s. 6d. to 5s. per quarter; bread, 6d. to 8d. per 4 lb. loaf; best tea, 2s. 8d. per lb.; best coffee, 1s. 3½d. candles, 4½; intoxicating drinks are about 50 per cent. higher than in England. The weights and measures in Victoria are in every respect similar to those used in England.

The religious, moral, and intellectual progress of the colony is shown to be highly satisfactory. As to the proportion of the sects, there is church accommodation for 129,000 Wesleyans, 67,500 Presbyterians, for over 63,000 Anglicans, and nearly the same number of Catholics, and for about 40,000 Baptists, evangelical Lutherans, Welsh Calvinists, &c., including 1670 Jews, and 1600 not specified, so that in all there are 2284 places of worship accommodating 368,890 worshippers. There are 111,973 Sunday-scholars taught by 11,851 teachers. The University of Melbourne has 367 graduates, and 712 students have been matriculated. The total expenditure in 1873 was 12,530*l.*, of which 4705*l.* was reimbursed by college fees. The Melbourne Free Library was visited in 1873 by 229,362 persons. In the same building there are a National Gallery and an Industrial and Technological Museum. The facility with which land can be acquired may be judged of by the fact that of 8,626,262 acres of purchased land in occupation, 2487 persons hold upwards of 500 acres; 1346 upwards of 350; 6371 over 200; 7137 over 100; 5617 over 50; 3465 over 30; 3797 over 15; 3761 over 5 acres; and 1721 from 1 to 5 acres. There are now in the colony 24 engine factories, 3 cutlery works; 2 bellows factories, 5 coach and wagon factories, 40 agricultural implement factories, 8 chemical works, 3 antimony smelting works, 2 electro-plate works, 1 lead works, 2 tin smelting works, 16 iron and tin works, 62 iron, brass, and copper foundries, and works and manufactories connected with almost every branch of industry, whether connected with the production of articles of utility or luxury.

Although to give an abstract of a mass of statistics such as is embodied in the volume under consideration would be impracticable, these facts will suffice to give an idea of the nature of the information furnished, and as Mr. Hayter has succeeded in putting them into thoroughly readable form, it cannot be doubted that the issue of the volume will prove alike beneficial to the classes for whom it is written and to the colony whose progress it records.

* "Victorian Year Book, Containing a Digest of the Statistics of the Colony for the Year 1873." By HENRY HEYLIN HAYTER, Government Statist of Victoria. Melbourne: John Ferres, Government printer. London: Trübner and Co.

FOREIGN MINES.

ST. JOHN DEL REY.—Telegram from Morro Velho (Rio, Feb. 22): Produce eight days of February, 9000 oits.; yield, 9·1 oits. per ton. Profit for the month of January, 8700*l.*

DON PEDRO.—Telegram from Rio, Feb. 22: Produce for the month (Jan.), 7200 oits. Profit 450*l.* Produce cleaned up (first division, Feb.), 5700 oits.

RICHMOND CONSOLIDATED.—Cablegram from the mine at Eureka, Nevada: Hall, London—Week's run, $44,000.

MINERAL HILL.—Mr. Oakes, the superintendent at the mines, writes, under date Feb. 1:—The ore raised this week is 40 tons, of an average grade of $40 per ton.

NEW ZEALAND KAPANGA (Gold).—James Thomas, Dec. 24: I have again an opportunity to send you a report of our progress ten days later than my advices *via* Brindisi. I am pleased to inform you that a good four weeks' work has been done by the shaftmen since my last monthly report of Nov. 24. During the past four weeks the work comprises—Cutting a cistern plat and hitches, with fixing the necessary bearers at the 31, and sinking the shaft 18 ft., with timbering and dividing same complete: total depth sunk to this date, 41 fms. 4 ft. In the bottom the ground continues favourable for sinking; the stone is easily bored, but tight for blasting. The stratum assumes a more compressed form and bluer colour than we have seen before, which is one of the best indications and description of stratum that always embeds gold-bearing reefs. The formation we are sinking through still maintains the usual westerly underlie, and is intersected with numerous joints, letting out streams of water immediately they are broken. The water is principally the drainage from the old workings. The east and west leader, before described, descends with the shaft; it is very regular and defined in appearance, and is lately much changed in character, presenting a very likely looking leader; for the past 18 ft. sinking it has become more compressed and compact, composed of fine quartzite and fine mundic. I forward a sample by this mail. I enclose a small section, showing the depth of shaft sunk—250 ft.—and the remaining distance to sink—about 50 ft.—to reach the 50 fm. level before we commence to drive to intersect the old lode. You will also observe the depth and extent of water drained from the old workings into the new engine-shaft. The water in the old mine goes down regularly as the new shaft is sunk. This drainage water alone about keeps the engine pumping at a uniform rate of 7 to 8 strokes per minute, the coming water in the shaft being exceedingly light, owing to the present dry summer season, for performing this difficult work. Every dispatch possible is made in sinking, and the machinery is in the best of order for pumping and winding. Writing you so recently leaves me little else to say.

CHICAGO (Silver).—W. S. Godbe, Jan. 30: Mine: During the fortnight ending 26th inst. much work of the unprofitable kind has been done in the left incline; the grade and direction of 130 ft. of track has been altered, to do which much blasting in rock has been unavoidable; from present indications at face of this incline it seems that we are going to have two shoots of ore; both are now small. In the main incline the ore is keeping about the same course as when I last wrote you—north of east, and dipping towards the heart of the hill; it is hoped that the ore output will now be somewhat increased.—Furnace: There is no change in the coal prospect, weather continuing adverse to increased supply. We are prevented by this cause only from running more than we stack. The ore supply at the works is large, and increasing daily. I trust soon to be able to advise you that this ore supply is being realised on our making every possible effort looking to that end; better weather would enable me to do this almost immediately.

GOLD RUN.—J. A. Stone, Jan. 31: My last letter was Jan. 23. To-day I have been with the manager of the Miners' Ditch Company, and measured out the tunnel, which is now in 249 ft., they having driven it 141½ ft. in the month of January. The past week they made 45½ ft., which is more tunnel than they ever before have made in one week; they concentrated their energies on our tunnel, and everything worked exceedingly well; they had no breaks or stoppages to retard their progress. I look for still better progress in February. I shall send my account in a few days. One of the owners in the Mill Company told me to-day that the direction the channel is now taking would bring it on to our property, so it would run the entire length of the old Cedar claim, which he strongly asserts is the best claim in this district. He also told me the Mill dirt was averaging $4 the carload (about ¾ ton), and that he could at any time by selecting the dirt get $60 the pan. I saw their last clean up of 1000 carloads weighed, which was a little over $4000. This should be very encouraging to our company, as it is still more evidence of the vast amount of gold in the old Cedar and Sherman claims.

BATTLE MOUNTAIN.—Capt. Richards, Feb. 4: As advised in my report of Jan. 21 last and No. 370, communication has been effected between the new shaft and the winze (Cook's), sunk down from the 188 ft. level; the ground has been squared, a tram-car road laid, plat cut sufficiently large at the shaft, and the new shaft is in full course of sinking night and day, and the progress which has been made is a matter for great satisfaction. A 260 ft. level has been commenced south of the new shaft: this it was necessary also to do previous to sinking to prevent accident to the men in the shaft blasting, and the 260 ft. level south will be driven, or otherwise as you feel disposed to direct; it can be resumed at any time now without interference to the shaft: but I have a point in the 260, west of the new shaft, and near Stevens's winze, which I expect, from indications, should contain ore; and I hope in my next week's report to be able to say more of this. In Smith's winze, sinking below the 260 ft. level, north of the new shaft and down 30 ft.: the ledge, although strong and fine looking, does not contain much ore; I hope, however, it may prove to be only a temporary change. In the back of the 260 ft. level, north of the new shaft, we are about to put in some more stull timbers. The lode in the stopes in the back of the 260, north of the new shaft, produces some good ores in red oxides, green and blue carbonates, and has produced well this week: 610 sacks raised during the fortnight.

NEW PACIFIC.—J. D. Pringle, Jan. 18: In compliance with your order, I closed the works on the 16th. There is about 4 tons of ore on hand, as yet assorted, and will have this assorted and worked as soon as possible. I have been endeavouring to lease the mine until May 1 next, with the privilege of longer period, providing the company does not commence sinking shaft in the spring. The terms mentioned were, "The company to receive 25 per cent. of all ore taken from the mine, the tributers to furnish all supplies, and to be at expense connected with the running of the mine and machinery." I should like very much to see levels driven each way from the cross-cut spoken of in my last. This point is the principal inducement to the parties that are now talking about leasing the mine. I think myself that the prospects are good for finding ore soon at this point, although at the present showing the ledge is small, and of little value. If I succeed in leasing the mine I will inform you of the fact immediately.

— C. O. Heanan, Jan. 31: At the request of Mr. Pringle, who is labouring under severe indisposition, I write to inform you that the mine is leased until May 1 next under conditions mentioned in his letter of the 18th inst.

INDEPENDENCE (Gold).—D. T. Davies, Jan. 31: The mine again in good order, and work resumed at 6th level on 30th. Two more men shortly to be employed to open the work more radidly. The cross-cut at bottom of shaft has been run 5 ft., making a total of 13 ft. (including shaft) from footwall. In 40 level, east shoot, the cross-cut going towards footwall is in 12 ft., and still in ore matter, with no indications of footwall. The stope and drift going west, 4th level (east shoot), are without any important change.

COLORADO TERRIBLE LODE.—Feb. 18: Warrants for the dividend of 4s. per share were posted on Feb. 10. The account sales of shipments to amount to 2648*l.* 1s. 4d. Shipments 61-67, comprising 65¼ tons, realised 4392*l.* 11s. 4d. Shipment 68, comprising 9½ tons, was sold at Liverpool, on Feb. 17, and produced 991*l.* 13s. 6d. The 69th shipment is expected to arrive daily. Between Dec. 14 and Jan. 23 the deliveries of ore by the agent were about 69 tons, and the cash receipts $11,565·76. Shipments 70 and 71, advised in the agent's letter of Dec. 9, have not been dispatched, Mr. Teal having sold the ore in Colorado. The produce for November is valued at $22,696; month's expenses, $7,879·33; $14,816·67. The December monthly statement shows ore raised of the value of $18,859; less month's expenses, $8205·59: balance, $10,653·41. The weekly reports of the different workings of the mine continue to be satisfactory.

EBERHARDT AND AURORA.—The directors have advices from Capt. Drake (Jan. 30) stating that, owing to the severity of snowstorms, he was unable to convey the ore to the mill, and in consequence thereof the mill had been shut down from the 9th to the above date. The directors have not yet been advised of the produce for January.

MENZENBERG.—R. K. Roskilly, Feb. 24: In the 45, west of cross-cut, south of Dickins's engine-shaft, the ground is still favourable for driving, which has at present a most congenial appearance, and the men are making excellent progress.

[For remainder of Foreign Mines, see to-day's Journal.]

SHIPMENTS OF AUSTRALIAN TIN AND COPPER.—The present month's shipments will be very large. Three vessels sailed for London during the past four weeks with the following:—The Benmore, with 5055 cakes of copper and 1675 slabs and 3478 ingots of tin; the Border Chief, with 1538 ingots of tin, and 4103 ingots and 1498 cakes of copper; the Ben Lomond, with 619 slabs and 2000 ingots of tin, and 3682 ingots of copper. Two vessels cleared to-day, and will sail early next week. Their cargoes contain—the Sir William Wallace, 201 ingots and 438 slabs of tin, and 4491 ingots and 24 cakes of copper; and the Christian Thompson, 4753 ingots and 444 slabs of tin, and 9440 ingots of copper. The aggregate value of the tin shipments from this port from Jan. 1 to the 12th instant was 433,652.—*Sydney Morning Herald*, Dec. 21.

NEW ALMADEN QUICKSILVER MINES.—During the year 1874 there were made at the mine 9030 flasks of quicksilver, which, at prices ruling during that period, brought in a gross income of considerably more than $1,000,000. There was paid out for labour alone $400,000, while a large amount was expended for permanent improvements, &c. Some of the improvements are worthy of mention. An iron-clad furnace, modelled after the one lately built and successfully operated at the quicksilver mines at Idria, Austria, has been erected, with improvements suggested by the experience of officers at Idria and New Almaden. This will soon be put into operation, and, in connection with the many other improvements made, it is expected to aid in the more successful working of the hacienda. Burleigh drills, like those used for driving the Hoosac Tunnel, Massachusetts, and also Ingersole drills, both worked by compressed air, were set at work in November last, and have given very satisfactory results in the rapid progress made with the drift and tunnel where they are worked. About 700 men and boys are on the daily pay rolls.—*San Jose Daily Mercury*, Jan. 28.

COPPER ORES.

Sampled February 3, and sold at Swansea, February 23.

Mines.	Tons.	Produce.	Price.	Mines.	Tons.	Produce.	Price.
Cape Ore	75	32½	£27 2 6	Cape Ore	3	51½	£42 0 0
ditto	75	32½	27 2 6	ditto	67	26⅞	21 14 6
ditto	75	32½	27 2 6	ditto	67	26⅞	21 10 0
ditto	74	32½	27 1 6	ditto	14	26	20 12 6
ditto	63	33½	27 12 6	ditto	65	33½	26 12 6
ditto	63	33½	27 5 0	ditto	7	33	27 5 0
ditto	62	33½	27 5 0	ditto	1	31¼	25 10 0
ditto	62	33½	27 7 6	ditto	12	31½	25 15 0
ditto	15	33¼	27 10 0	ditto	19	11¼	8 11 0
ditto	38	38¼	31 2 0	Australian	7	16¾	12 5 6
ditto	37	27⅞	22 3 0	Copper Precl.	5	30½	22 0 0
ditto	29	51	41 11 0				

TOTAL PRODUCE.

Cape Ore	923	£24,293 17 6	Copper Precipitate.	5	£110 0 0
Australian Ore..	7	85 18 6			

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Names.	Tons.	Amount.
Copper Miners' Company	196	£ 4,585 11 6
P. Grenfell and Sons	225	6,103 2 6
Nevill, Druce, and Co.	96	2,501 19 6
Vivian and Sons	109	2,526 14 0
British and Foreign Copper Company	63	1,716 15 0
Mason and Elkington	100	2,559 18 6
Charles Lambert	81	2,675 10 0
Sweetland, Tuttle, and Co.	65	1,823 5 0
Total	935	£24,492 16 0

NO SALE on March 9.

TOTALS AND AVERAGES.

	21 cwts.	Produce.	Price.	Per unit.	Standard.
Whole sale	935	31 13–16	£26 3 10	16s. 5d.	£102 10 0

COPPER ORES.

Sampled Feb. 3, and sold at the Royal Hotel, Truro, Feb. 18.

Mines.	Tons.	Price.	Mines.	Tons.	Price.
South Caradon	79	£5 17 6	East Caradon	35	£4 13 0
ditto	78	8 0 6	ditto	32	4 13 0
ditto	76	3 19 6	Bedford United	70	3 16 0
ditto	70	14 2 0	ditto	40	2 15 0
ditto	64	8 11 0	Wheal Russell	69	4 3 6
ditto	43	6 12 0	ditto	37	3 12 0
Marke Valley	82	3 1 6	Prince of Wales	54	4 19 0
ditto	75	3 6 0	ditto	43	4 9 6
ditto	73	4 4 6	Gawton	74	2 7 6
ditto	41	7 12 6	ditto	12	7 19 0
ditto	31	4 3 6	Phœnix	23	7 12 6
ditto	29	1 5 6	Wheal Friendship	21	8 8 0
Hingston Down	102	2 1 6	ditto	19	3 17 6
ditto	98	2 4 0	Duchy Great Consols	19	1 15 6
ditto	60	2 1 6	ditto	18	1 15 6
Glasgow Caradon	84	5 16 6	Treffry's Regulus	30	15 10 0
ditto	73	4 5 6	Calstock Consols	12	3 4 0
ditto	54	4 14 6	Belstone	11	6 7 6
ditto	29	4 3 6	Skewes's Ore	4	6 5 6
East Caradon	72	5 1 0			

TOTAL PRODUCE.

South Caradon	410	£3210 3 6	Gawton	86	£ 271 3 0
Marke Valley	331	1287 2 0	Phœnix	52	396 10 0
Hingston Down	260	551 15 0	Wheal Friendship	40	250 11 0
Glasgow Caradon	240	1177 12 0	Duchy Great Con.	37	65 13 6
East Caradon	140	679 16 0	Treffry's Regulus	30	425 0 0
Bedford United	110	376 0 0	Calstock Consols	12	38 8 0
Wheal Russell	106	421 5 6	Belstone	11	70 2 6
Prince of Wales	97	459 14 6	Skewes's Ore	4	25 2 0
Average standard		£113 16 0	Average produce		6¾
Average price per ton			£4 19 0		
Quantity of ore		1966	Quantity of fine copper 133 tons 3 cwts.		
Amount of money			£9745 18 6		

LAST SALE.—Average standard £108 19 0 | Average produce 7¾

Standard of corresponding sale last month, £111 14 0—Produce, 6¾.

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Names.	Tons.	Amount.
Vivian and Sons	207	£1339 9 6
Grenfell and Sons	170½	1570 1 10
Nevill, Druce, and Co.	255½	948 12 0
Williams, Foster, and Co.	508	2082 14 0
Mason and Elkington	327 5–6	1283 13 1
Copper Miners' Company	78	625 19 0
Charles Lambert	132	432 5 8
Newton, Keates, and Co.	160½	1092 14 0
Sweetland, Tuttle, and Co.	126 5–6	370 9 7
Total	1966	£9745 18 6

NO SALE on Thursday last, Feb. 25.

Copper Ores for sale at Tabb's Hotel, Redruth, on Thursday next.—Mines and parcels.—West Tolgus 240—East Pool 120—West Seton 93—South Crofty 69—Cathedral 32—Wheal Seton 31—East Basset 31—West Basset 28—West Roskear 15—New Dolcoath 6.—Total, 662 tons.

PARIS INTERNATIONAL EXHIBITION, 1867.

VIENNA INTERNATIONAL EXHIBITION, 1873.

LONDON INTERNATIONAL EXHIBITION, 1874.

CORNWALL POLYTECHNIC SOCIETY, 1867 and 1873.

TANGYE BROTHERS AND HOLMAN,

10, LAURENCE POUNTNEY LANE, LONDON, E.C.,

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FOR

"THE SPECIAL"

DIRECT-ACTING STEAM PUMP.

OVER 4000

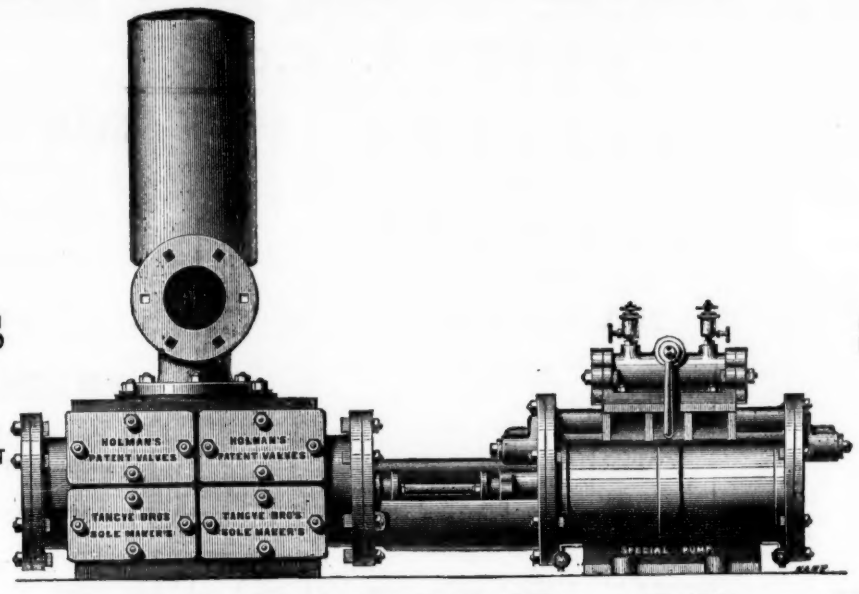
OF

The "Special"

STEAM PUMPS

HAVE BEEN SOLD

SINCE THEIR INTRODUCTION IN 1867.



200 SIZES

And combinations of

The "Special"

STEAM PUMPS

ARE NOW

MADE FOR EVERY VARIETY

OF PURPOSE.

GREAT REDUCTION IN PRICES.

The following sizes are suitable for low and medium lifts:—

Diameter of Steam Cylinder ...In.	3	4	4	4	5	5	5	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10
Diameter of Water Cylinder ...In.	1½	2	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	5	6	7	8	5	6	7	8	9	5	6
Length of Stroke .....In.	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	12	12	12	18	24	12	12
Gallons per hour	680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070	7330	9750	13,000	5070	7330	9750	13,000	16,519	5070	7330
Price .....£	**16**	**18**	**20**	**25**	**22 10**	**27 10**	**32 10**	**25**	**30**	**35**	**40**	**30**	**35**	**40**	**45**	**50**	**40**	**45**	**50**	**55**	**65**	**50**	**55**	**60**	**70**	**85**	**55**	**60**

CONTINUED.

Diameter of Steam Cylinder..In.	10	10	10	10	12	12	12	12	12	12	14	14	14	14	14	14	16	16	16	16	16	18	18	18	18
Diameter of Water Cylinder..In.	7	8	9	10	6	7	8	9	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14
Length of Stroke .....In.	12	18	24	24	18	18	18	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Gallons per hour	9750	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000
Price .....£	**55**	**75**	**90**	**100**	**75**	**80**	**85**	**110**	**120**	**140**	**110**	**120**	**130**	**140**	**160**	**180**	**140**	**150**	**160**	**180**	**200**	**190**	**200**	**220**	**240**

Intending purchasers of Steam Pumps would do well to observe the great length of stroke, short steam cylinder, and short piston of the "Special" Steam Pump, as compared with the short stroke, long steam cylinder, and long piston of the Pumps of other makers, as the efficiency and durability of the machine, and the space occupied by same, greatly depend upon this. The advantage of long strokes will be obvious when purchasers are reminded that each set of suction and delivery valves of a "Special" Steam Pump with 24 in. stroke, running at 120 ft. per minute, would open and close only 30 times per minute, as against 120 times per minute in a Pump with only 6 in. stroke performing same duty.

The "Special" Steam Pump can be worked by Compressed Air as well as by Steam.

HUNDREDS of these PUMPS are USED for HIGH LIFTS IN MINES, for which purpose they are made with 21, 24, 26, 28, 30, and 32-inch Steam Cylinders, and 36 48 and 72-inch Strokes.

Holman's Patent Self-acting Exhaust Steam Condensers,

FOR ALL KINDS OF STEAM PUMPS AND HIGH-PRESSURE STEAM ENGINES.

TURNS WASTE STEAM INTO GREAT POWER.

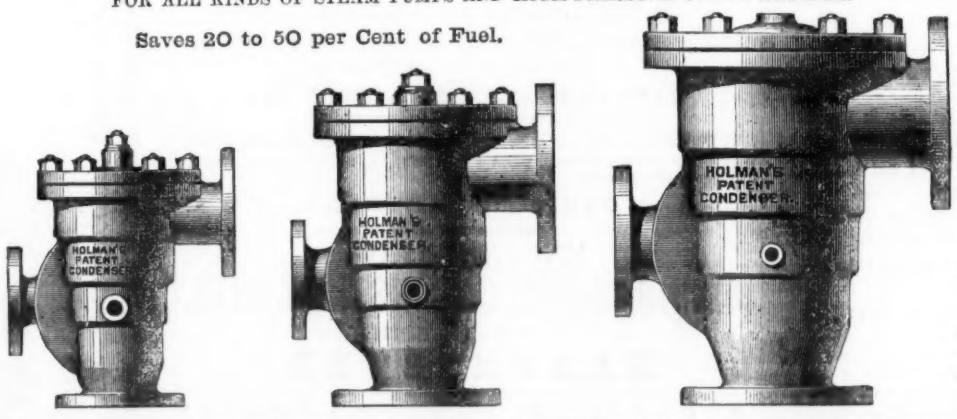
REQUIRES NO THREE-WAY COCKS, CHECK, or REGULATING VALVES.

SAVES HALF ITS COST IN PIPES AND CONNECTIONS.

PREVENTS ALL ESCAPE OF STEAM IN MINES OR ELSEWHERE.

REQUIRES NO EXTRA SPACE.

Saves 20 to 50 per Cent of Fuel.



These Condensers are made to suit any size and kind of Steam Pump. They form a part of the suction pipe of the Pump, and while they effectually condense the exhaust steam, they produce an average vacuum of 10 lbs. per square inch on the steam piston, increasing the duty of the Engine, and effecting a saving in fuel of from 20 to 50 per cent.

In Mining operations these Condensers will be of great value.

All Boiler Feeders are recommended to be fitted with these Condensers, as not only is the exhaust steam utilised in heating the feed water, but is returned with it into the boiler.

The following Testimonial gives one Example of the Power Gained by the action of Holman's Patent Condensers:—

MORLEY COLLIERY, WIGAN, October 16th, 1874.

Messrs. TANGYE BROTHERS AND HOLMAN.

GENTLEMEN,—I have great pleasure in recording my entire satisfaction with the working of the Holman's Patent Steam Pump Condenser which you have supplied to us. The complete condensation of the steam is, apart from its value in the strict economic sense, a most valuable feature in the drainage of underground workings. The perfect manner in which this important result is accomplished by your Condenser is extremely creditable to you, and merits the thanks and commendation of the Mining Engineer. When we start the "Special" Steam Pump the Condenser commences working automatically, and maintains a constant vacuum of 10¾ lbs. per square inch, even when we run the Pump upwards of 80 strokes (106 feet) per minute. It may perhaps be interesting to you to know that when we were running the Pump at 84 strokes (168 feet) per minute, the steam gauge indicating a steam pressure of 36 lbs. per square inch, 80 yards from the Pump, and the Condenser vacuum gauge on the exhaust pipe indicating a steady vacuum of 21½ inches, I turned the exhaust steam from the Condenser into the atmosphere, when the speed at once fell to 44 strokes per minute. The working economy thus shown is really so great that the cost of the Condenser must be saved in a very short time. (Signed) J. THOMPSON.

Price from 30s. to 40s. per inch diameter of Steam Cylinder, according to the relative Diameter of Pump for which Condenser is required.

Agents for the North-Eastern District:—TANGYE BROTHERS & RAKE, St. Nicholas Buildings, Newcastle-on-Tyne.

THE "LEVET" ROCK DRILL.

SUPERIOR TO ALL OTHERS.

FOR PARTICULARS OF

Rock-drills, Air-compressors, Coal-cutters, & all other Mining Machinery,

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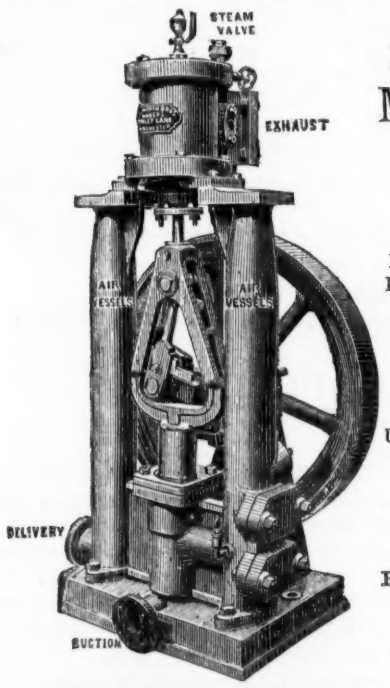
ASHWORTH'S IMPROVED

STEAM RAM PUMPS.



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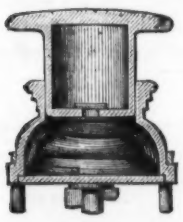

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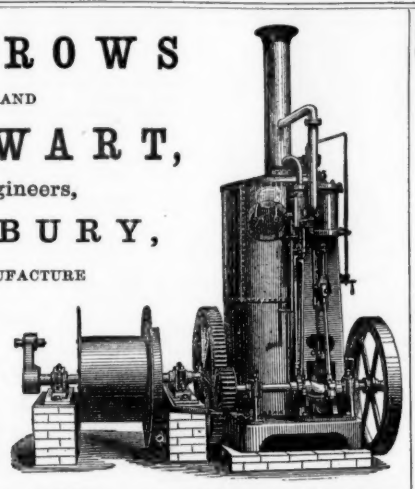

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WINDING COAL, PUMPING, &c.

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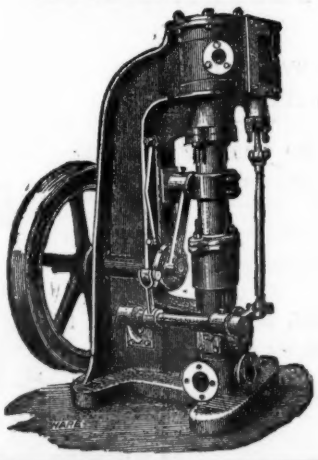
BIRMINGHAM.

MAKERS OF WINDING ENGINES, VERTICAL DONKEY PUMPS, &c.



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Every description of Leather, India-rubber, and Gutta-percha for Engineering and General Mechanical purposes.

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This company is prepared to contract for the excavation of Rock, such as "SHAFT SINKING," "RAILWAY and other TUNNELLING," "DRIVING MINE LEVELS," "SLATE and other QUARRY WORK," &c. The company has also been appointed Agents for the Sale of

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ROCK-DRILLING AND AIR-COMPRESSING MACHINERY,

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THE DRILLING MACHINES (IN FIVE SIZES) CAN BE MOUNTED ON ANY DESCRIPTION OF CARRIAGE OR SUPPORT, according to the nature of the work.

The Air-Compressors are adapted for Driving Rock Drills, Coal Cutting, Pumping, and Underground Machinery, where the Motive Power has to be conveyed long distances.

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VALVELESS ENGINES, AIR-COMPRESSORS FOR COLLIERIES AND PUMPS,

With and without Condensing Apparatus

CHEMICAL PLANT OF EVERY DESCRIPTION.

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GLASS MACHINERY.

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AN INDISPENSABLE APPENDAGE TO STEAM BOILERS.

MOSCOW, 1872.

In operation to upwards of 2,550,000 h.p.

VIENNA, 1873.

SAVES 20 to 25 per cent. of Fuel.

PARIS, 1867.

EDWARD GREEN AND SON, Engineers and Sole Makers, 14, St. Ann's-square, Manchester.

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Manufacture, in Galvanised and Corrugated Iron,

IRON ROOFS, IRON BUILDINGS, IRON SHEDS,

Which they have extensively supplied and erected for mining requirements at home and abroad.

ESTIMATES FURNISHED ON RECEIPT OF PARTICULARS.

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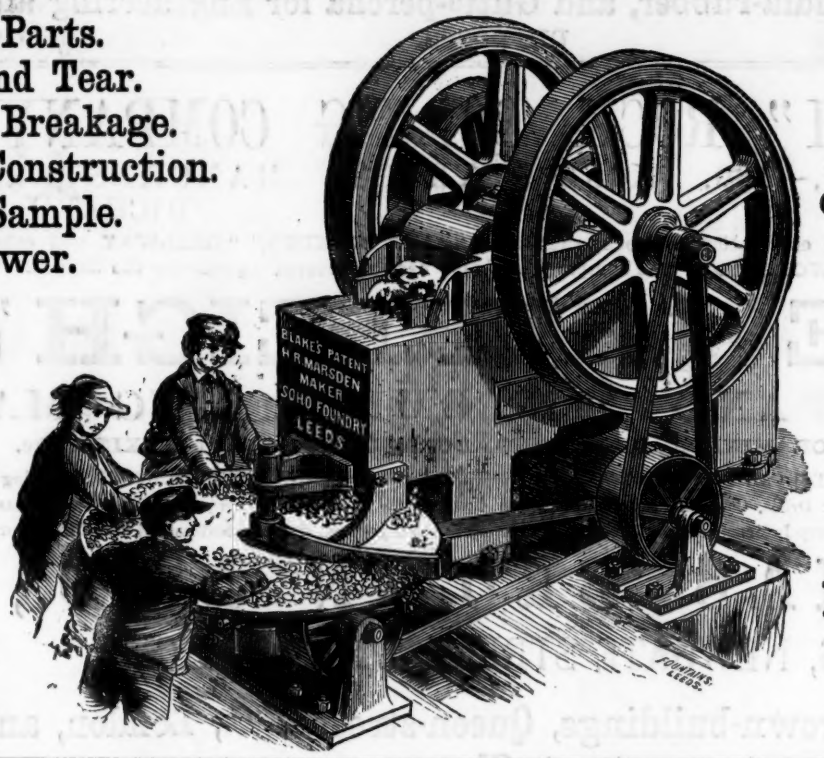

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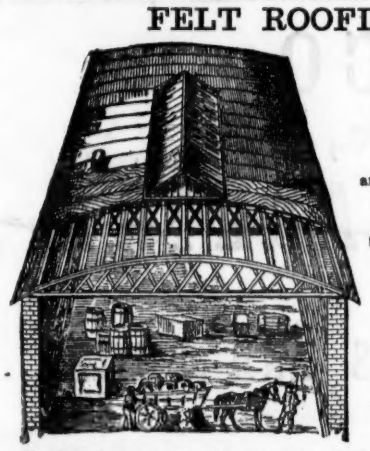

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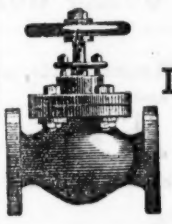

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